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American Institute of Mining Engineers.
Pittsburgh Meeting.

Session of Wednesday Evening, Oct. 16.

(CONTINUED FROM PAGE 284.)

During the reading of his paper on the American Pig Iron Manufacture, Mr. EDMUND C. PECHIN remarked that he had sent to New York for comparative analysis samples of Connellsville coke which had been exposed to the weather for two years, and others, freshly manufactured, and, to his surprise, the analyses, carefully made by Mr. SCHUYLER VAN RENSSELAER, showed there was no loss of carbon whatever by exposure in the Connellsville coke. This being the fact, it proves conclusively that coke is one of the most valuable materials for the iron-master, because it can be stored indefinitely; while even the best anthracite will lose a percentage of its carbon, and bituminous coal loses from 10 to 25 per cent. and upwards, in weight by exposure. The question was asked whether that rule holds good in regard to Pittsburgh and other coke as well as that of Connelsville.

Mr. PECHIN said that he could not answer that, as he intended gentlemen to look after their own coals and cokes. (Laughter.) He then alluded to the education of workingmen, stating that a night school had been started in Philadelphia which was carried on with great success until the late war broke out.

THE PRESIDENT thought this question of management of workmen was a good deal like the training of children. Both required sincerity rather than ingenuity. Much statesmanship might be observed in some families, expended with poor results, because it was brought out on great occasions only. Judgment and firmness, or even generosity, displayed in crises, will not take the place of uniform patience and justice. In fact, any system of dealing with children or employees which brings on crises, is wrong. Of course, it is easier to neglect them until a collision makes us aware of their presence and rights. In this and every other department of education and government, the right way is the hardest, and the arbitrary, mechanical way is, for the time being, easiest. We ought not to complain of the want of confidence among workingmen, considering that confidence, to be worth anything, must be a plant of slow growth, and nourished by a long experience of the sincere good-will of employers. If we tell men on a strike that they are foolish and unreasonable; that their interests are really identical with ours; that we love them, and they ought to love us, etc., etc., they judge our words in the light of our lives, and they can see through our game to put down their wages as plainly as we do ourselves. Nothing can, and nothing ought to, win them but sincerity and consistency; and I am sure that these will not fail.

I wish to express my hearty concurrence in the phrase employed by Mr. PECHIN, in his paper, in alluding to "sheer force and blind stupidity, whose *only* protection is a high tariff." Nobody denies that governmental protection can do much for a given industry; but what such assistance can do is temporary. The true protection, both of capital and labor, is educated intelligence. This it is that makes high wages compatible with cheap products, because the workman puts so much more brain—that is, value—in his work. The nations abroad, whose competition we have had to fear, are those that pay the highest wages to their skilled laborers. The pauper labor of England in manufactures is a myth. It is not pauper labor abroad that we should fear, but pauperism in the minds of our people. I do not mean that there is great danger of it. The intelligence of the masses is characteristic of America, and it will be the true basis of our industrial and commercial power. That it may, however, be greatly advanced beyond its present standpoint, especially among our miners, is a proposition which nobody will dispute.

Mr. JAMES PARKE, of Pittsburgh, said, with reference to the loss of carbon in fuels: This is the first time I ever heard that subject broached in this practical way, and I trust all the members of our Institute will look into it. Let us test our coals, and see how fast they do lose carbon. I believe that when carbon is crystallized, as it were, in coke, it is fixed and permanent; but it is a great thing to know that as a fact.

Mr. J. S. ALEXANDER, of Philadelphia, said: I went away from our Philadelphia meeting full of the subject of education for our miners, but the operators in our Indiana region all laughed at me. There is lamentable lack of co-operation among those who should start the thing. Meanwhile, the miners will have some sort of literature and mental food, and they are apt to take trash, instead of really valuable information. The members present seem to be more interested in the subject of coke than in education. But I hope they will not fail to consider the latter, which is one of the great questions of the day.

Prof. E. T. COX, of Indiana: Mr. President, I propose to go back to the coke. (Laughter.) I was not aware of any loss of fixed carbon in coal. The general impression has been that it is a loss of volatile matter (hydro-carbons), and not of carbon. We all know that the Connellsville coke is of excellent quality. I have not succeeded in finding in the West anything that approaches it. This question of the elimination of carbon ought to be fully investigated.

Mr. WILLIAM FIRMSTONE, of Glendon, Pa.: I have tried coke after two years' exposure, and it gave as much heat in the blast furnace as that freshly made. We thought the old coke made better iron, probably on account of the elimination of sulphur; but otherwise there was no perceptible difference.

Prof. COX: Some coke that had been made five years was sent to Buffalo for analysis, and the report was that it was just as good as new coke.

Mr. ALEXANDER: My own experience has been that where coal has been exposed to moisture it has lost carbon.

Prof. LANGLEY, of the Western University, Pittsburgh, gave a brief and exceedingly clear statement of physical and chemical points bearing on the subject, which will be published in our next number.

The session was then adjourned.

Second Session—Thursday Morning, Oct. 17.

After the election of new members, a paper was presented by the President on behalf of the author, Mr. R. NEILSON CLARK, of Cañon City, Colorado, on

THE TERTIARY COAL BEDS OF CAÑON CITY.

This paper will be published in full next week, with the map illustrating it. Specimens of the coal and argillaceous iron ore were exhibited to the Institute. Mr. PECHIN inquired where the argillaceous ore was found, and upon the President's reply that it was shown at present only in a lean and slender outcrop near the slope of the coal mine, Mr. PECHIN continued, that this need not discourage exploration of it, as the carbonate ore of the Pennsylvania coal measures appears at the outcrop as a mere stain of rust, and gradually increases to beds of 30 inches thickness as it is penetrated.

Prof. COX—I have myself seen on the borders of New Mexico at least 250 feet in thickness of magnetic iron. I regard the resources of that country in iron ore as unlimited, and it is to be regretted that we cannot reach them and make them available now. But they will be reached before long.

THE PRESIDENT remarked that the iron industry of the world has usually been developed first by the use of charcoal; but this means is not available in many of our western districts, by reason sometimes of the scarcity of timber, sometimes of the big price of labor. The charcoal-burner of the West is not a person reduced by misfortune or condemned by ignorance and lowly birth to follow that business for a meager living. He wants to make his $4.50 per day, at least. Charcoal costs in Colorado about 20 cents; in Eureka, Nevada, 30 cents, and in Utah 29 to 33 cents in most localities, though the price for charcoal (dust and all) at Salt Lake City is 25 cents per bushel. In Cerro Gordo, California, the price is 29 cents. We may fairly assume the general price in the West, dependent on that of labor, as about 20 cents per bushel, at or near the heaps. I saw in the neighborhood of Salt Lake last summer several car loads of Connelsville coke, costing, when delivered, about $33 per ton; and at this price it was much more economical than charcoal, as a smelting fuel. The charcoal used in Utah is either brought by rail from the Sierra Nevada, or burned in the cañons of the Wasatch and Oquirrh ranges. The latter variety, being made of light woods, is inferior in quality. It has been reported to me that deposits of genuine anthracite exist in New Mexico; but their extent is not determined. The principal mine, in the Placer Mountains, near Real de Dolores, has an anthracite bed of 5 feet, with roof and floor of shale. The coal contains 87.5 per cent. of fixed carbon. A detailed description of these anthracite beds, so far as they are known, is contained in my Report on Mines and Mining for 1870. Part I., chapter LIX.

Prof. COX—I believe I had the pleasure of being the first to visit the anthracite mines of New Mexico In my report on the subject, I described the coal as hard and brilliant. But it contains a large amount of water, the volatile matter being nearly all water, though in appearance the coal is like the best Pennsylvania anthracite. When we have thoroughly studied these Rocky Mountain coals, we may change some of our notions concerning their classification. I analyzed this anthracite; and so far as I now remem-

ber (it was many years ago) there was not more than 12 per cent. of volatile matter in it. Probably it contains some phosphorus. It is well known that all coal is of vegetable origin, and all vegetables contain a small proportion of phosphorus. This anthracite is about 27 miles from Santa Fe, and very near to rich mines of lead ore, which could, and will some day, be smelted with it.

PRECIPITATION OF GOLD IN A REVERBERATORY HEARTH.

THE PRESIDENT said: I wish to call the attention of the Institute to a curious subject, brought to my notice last summer by Mr. BEGGER, the accomplished metallurgist of the smelting works of the Boston and Colorado Company at Black Hawk, near Central City, Colorado. At these works, the richest auriferous sulphurets of Colorado (particularly copper pyrites) are smelted in reverberatories, together with roasted tailings (iron pyrites), and the gold and silver are concentrated into a new, artificial sulphide, or copper matte, containing $1,500 and upwards of the precious metals per ton, and this is shipped to Swansea. I will say in passing, that this shipment of an unrefined product, like the similar shipments from Utah and Nevada to San Francisco, Chicago, St. Louis, Newark, New York and Europe, of crude argentiferous lead or "base bullion," is not a sign of incomplete metallurgy here, but has a sound business reason. The separation of the precious metals in the West would be more expensive, to begin with; and then it would necessitate the movement of these metals by express, at high rates and risk, to commercial centers or coining mints, while the base metals having no home market, must be shipped and sold at little or no profit. At present, the gold and silver, safely packed, as it were, in the base metals, are transported with safety as ordinary freight; and the base metals probably more than pay cost of shipment and separation.

To return to the Black Hawk reverberatories. On a recent occasion, the hearth of one of them was broken up for repairs, when it was found that throughout the mass of pounded quartz of which it was made and to a depth of fourteen inches and more, below the surface, gold had deposited itself in the bright metallic form which we find in nature, and, in many places, quite isolated from any other metallic combination—like free gold in natural quartz. Near the surface, of course, we find also particles of the matte; and a little deeper there are bright green spots, doubtless consisting of an arseniate of copper; but the isolation of the gold is complete, and difficult to explain. Mr. BEGGER and other metallurgists have been able to suggest only the bold hypothesis of a downward sublimation of the gold. A great difficulty arises from the absence, so far as we can judge, of such a temperature as would effect this. But perhaps we may venture to fall back on our ignorance of what nature may accomplish with a smaller force acting through a longer time.

Mr. SWEET, of Syracuse, agreed that time would be an important element, but believed that the precipitation of the gold was the result of fusion.

Mr. A. EILERS, of New York—I noticed in several instances that this gold was associated with arseniate of copper. This is perhaps significant, when we recall that in nature gold occurs so often with arsenides and arseniates.

Prof. COX—It is possible that this reduction of the metal took place from heated vapors by the presence of copper, or it may have been formed by a galvanic process. It seems likely that the copper had some agency in reducing the gold.

THE SECRETARY—The singular features attending the association of native silver and copper in the Lake Superior mines are explained in that way.

THE PRESIDENT—An appeal to galvanism is only a change of words. Galvanic action does not take place without a corresponding chemical decomposition.

Prof. LANGLEY remarked that substances are frequently volatilized at lower temperatures than their proper points of volatilization, through the presence of more volatile bodies. Thus the vapor of lead might carry gold with it, and the gold might be precipitated while the lead remained in vapor-form, and so escaped.

THE PRESIDENT—That is very nearly the hypothesis to which we are crowded by the circumstances of the case, though I must confess that lead is not usually a principal ingredient of the ores treated in the Black Hawk furnaces. Prof. HILL has, however, I believe, smelted lead-bearing ores in his reverberatories, and it is also true that some galena occurs in the sulphurets of Gilpin County. If the members could inspect all the samples of the hearth which I saw, I think they would give up the hypothesis of a simple fusion. Still, we must remember the strange phenomenon of filtration, observed in so many operations of chemistry—on the border-land, as it were, between physical and chemical reactions. The decolorization and purification of liquids, the phenomena of dialysis, and even the asserted protection against miasma afforded by so coarse a filter as a mosquito-netting, are instances, though not, perhaps, in strict analogy, which may lead us to suspect that through the interstices of a hearth of pounded quartz a segregation of one metal might take place, even out of a fluid matte.

CUTTING CAST STEEL WITH WROUGHT IRON.

Mr. JACOB REESE, of Pittsburgh, invited the members to view at his works the cutting of cast steel by means of a swiftly revolving disk of wrought iron. It is a peculiar feature that the steel becomes hot, the cuttings being semi-fused, while the wrought iron disk remains comparatively cool. Specimens of steel so cut, and of the cuttings, were exhibited.

[TO BE CONTINUED.]

Three-high Rolls.

BY ALEX. L. HOLLEY, C. E.*

A CHARACTERISTIC, and to Americans, an amusing discussion of the three-high rail mill, arose out of the reading of Mr. Lauth's paper on three-high plate mills, at the Glasgow meeting of the Iron and Steel Institute.

From the report of the meeting in the English papers, it appears that Mr. Menelaus, the celebrated rail-maker of Dowlais, could not wait for the discussion of Lauth's *plate* mill, but launched at once into the British objections to the three-high *rail* mill, which is quite another matter.

The American mill, which is very different in principle and arrangement from the mill used abroad, appears never to have been understood by foreigners, although many of them have observed its working, during the last fifteen years, in our various iron and steel works. American Iron Masters certainly do not complain of this oversight, much as they may wonder at it.

Mr. Menelaus, Mr. Snelus and Mr. Williams prefer the two-high mill for the following alleged reasons:

1st. It requires a smaller stock of rolls, as compared with the two-high mill.

2d. The section of American rails is not uniform on the two sides, due to the fact that the top and middle rolls in a three-high mill are movable, while the bottom roll is fixed.

In order to test the value of these objections, it will be necessary to observe the difference between the English and the American mill—a subject which I had the honor of presenting to this Institute at a former meeting. Fig. 1, shows the American three-high rolls. The top and bottom rolls are deeply grooved, and the middle roll is nearly plain—*i.e.*, the middle roll, answers as a cover or lid to the grooves of the other rolls. The piece enters groove No. 1 between the bottom and middle rolls; it is then returned through No. 2, between the top and middle rolls, and so on above and below the middle roll, to the end. There must of course be a slight space between the groove and its cover, that is to say, between the collars of the upper and lower rolls and the collars of the middle roll, and into this space a fin of metal is squeezed out at each pass. If this space always occurred at the top of the groove, or always at the bottom of the groove, the fin would be increased at each pass, and ultimately spoil the rail. It is necessary to reverse the position of this fin at each pass, and this is just what the American three-high mill does. The grooves open alternately upwards and

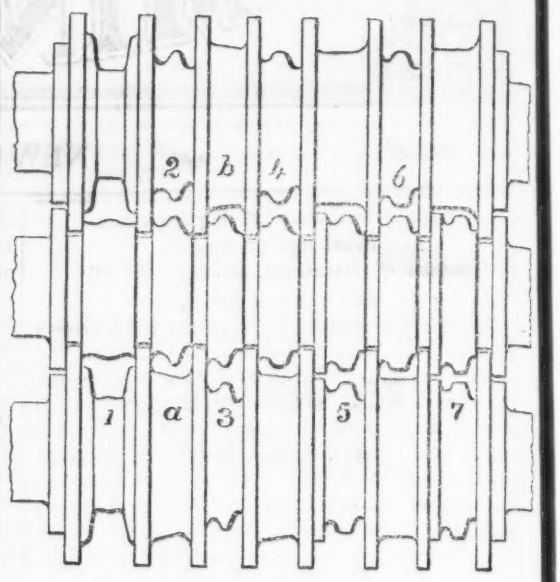
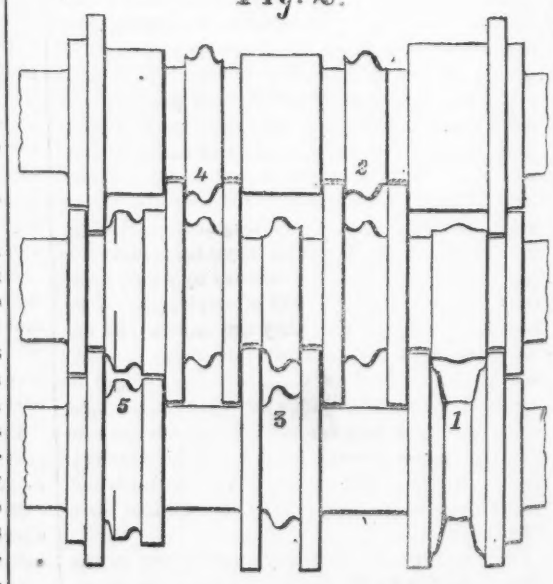


Fig. 1.

downwards. In groove No. 2, the top of the flange comes against the solid body of the roll, and no fin forms. But the bottom of the flange occurs at the opening between the top and middle roll, and here a fin forms. On the next pass, No. 3, the fin that was formed on the bottom of the flange is smoothed out by coming in contact with the solid body of the lower roll, and a fin forms at the top, which fin is, in turn, smoothed out by No. 4 groove, and so on to the end. At the same time it will be observed that the rail is *not turned over;* the flange is always at the right. This feature is essential in rolling, not only rails, but beams and all finished bars that require closed grooves.

Now in the English three-high mill, Fig. 2, the bot-

Fig. 2.



tom and *middle* rolls are grooved, instead of the bottom and top rolls. The grooves all open upwards, instead of alternately upwards and downwards. Hence, to smooth out the fin left at the top of the flange by pass No. 2, the rail must be turned over before it enters pass No. 3, in order to bring the fin

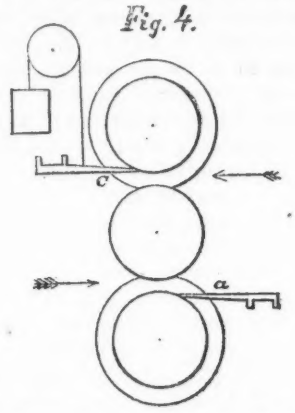
* A paper read before the Am. Inst. of Mining Engineers at the Pittsburgh meeting, October, 1872.

in contact with the solid body of the bottom roll. The rail *must be turned over after each pass*, with hooks and tongs and hard work, while in the American mill it is simply caught on the hooks and entered just as it comes out.

It will also be observed that the English mill requires much more length of roll, for a given number of passes. The rolls shown are of the same length, but the American mill has seven passes while the English has but five. This is due to the fact that in the latter mill the plain roll—in this case the top roll, forms a cover to the grooves of one of the grooved rolls only, *i. e.*, of the middle roll. Enough space has to be taken out of the middle roll to form the covers for the grooves in the bottom roll. In the American mill, however, the middle roll forms the cover for the grooves in both the grooved rolls.

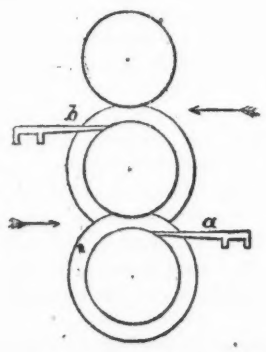
The question now arises, why is the English form of mill used? With the collared rolls and deep box grooves, it is necessary to employ the guide, *a*, Fig. 4, which is a sort of chisel, lying in the groove like a

Fig. 4.



turning tool, to peel the piece out of the groove. Otherwise the side friction of the collars against the piece would wind it around the roll. When the three-high mill was first introduced abroad, it seems to have been supposed that the guide must lie in the groove by gravity—that it could only be applied to the top of a roll. Hence the bottom and middle rolls, Fig. 5, must be grooved, for on the top of these

Fig. 5.



rolls the piece passes. The Messrs. FRITZ, of Pennsylvania, however, did not take this for granted. They saw the immense advantages of the grooved top roll, instead of the grooved middle roll, and they at once devised the very simple expedient of a hanging guide, *c*, Fig. 4, to peel the piece out of the *bottom* of the groove in the upper roll. But a guide in the bottom of a groove will fall out—then it must be held in—and what more simple and durable device for this purpose can be imagined, than the counterweight, affording a uniform pressure on the roll, and capacity to yield to its inequalities. We have read that for the want of a horse-nail an army was lost; for the want of an almost equally small and obscure piece of iron—a hanging guide—our English friends have lost, and ever persist in not finding, the signal advantages of the grooved top roll—the advantage of not turning the piece over at each pass, and the advantage of shorter rolls for a given number of passes.

We can now understand why MR. MENELAUS, having, as he states, an acre of two-high rolls of different patterns, objected to the three-high mill, on the ground that it would give him an acre and a half. The three-high mill he really criticises, has but five passes in a given length; the mill he meant to criticise has seven, in the same length, and this fact alone places the American three-high mill nearly on a par with the two-high mill in respect of number of spare rolls required.

But this is not all; taking beams and miscellaneous bars, as well as rails, the length of roll to be changed, in order to go on another pattern, is actually less in the three-high than in the two-high mill. This arises from the fact that in the three-high, the same groove is in most cases used twice over.

In Fig. 1, if a groove were cut at *a*, directly under No. 2, and a groove at *b*, directly over No. 3, and so on, these passes all being of the same width and contour, but with regularly decreasing depths, the figure would represent a three-high mill for beams and many other shapes—and indeed, rails are sometimes, and may always, be rolled in this way. Now in this mill, supposing the length of roll occupied by a groove and its collars to be 9 inches; two passes would require 9 inches length of bottom roll, 9 inches of middle roll, and 9 inches of top roll=27 inches total length of roll. In a two-high mill, however, two passes would require 18 inches length of bottom roll and 18 inches length of top roll=36 inches total length of roll. The amount of three-high rolls to be changed, then, to produce a new pattern of beam or bar, is but 75 per cent. of the amount to be changed in the two-high mill, so that for general work, Mr. Menelaus' acre of rolls would be reduced to three-quarters of an acre, instead of increased to an acre and an half, by using the three-high mill.

In a common form of American three-high rail rolls, 2 roughing grooves are worked over and over, making 4 passes, and 3 are worked once=7 passes in 5 grooves. One finishing groove is worked over and over, and 4 are worked once=5 passes in 5 grooves. It a groove and its collars occupy 8 inches length of roll, the total length of three roughing and three finishing rolls will be 240 inches. In a two-high mill having the same number and size of passes, the total length of all the rolls will be 208 inches or about 87 per cent. of the length required in the three-high mill. To off-set this slight increase in the amount of rolls used, the three-high mill presents very great advantages over the old form of two-high mill with rolls moving continuously in one direction. 1st. It turns out twice as much product in a given time, since in the two-high mill the piece returns over the top roll without getting any reduction. 2nd. It keeps the piece the same side up, while the two-high mill requires it to be turned over at each pass. The two-high mill is perfectly represented, in this respect, by removing the top roll of Fig. 1. All the grooves open upward, and in order to prevent the fin from growing on the top of the flange, the rail must be turned over so as to come against the solid body of the bottom roll. 3rd. The piece in the two-high mill, has to be dragged over the top roll, while in the three-high mill it is forced back by the rolls.

As compared with the reversing two-high mill, the American three-high has the advantage of keeping the piece the same side up all the time, thus increasing the product, and decreasing the strain on the men. The reversing mill, with either the clutch or the reversing engine, is a much more costly machine to construct and maintain than the three-high mill connected directly to the engine. It works somewhat more slowly than the three-high, and the impression among experts is, that it is less economical of steam.

As we have observed, the three-high mill requires less changing of rolls, for miscellaneous purposes. In beam-making—a large and increasing branch of the manufacture—its advantages are most conspicuous. Orders for beams are always smaller than for rails—often less than a turn's work—so that the rolls must be often changed. American mill men can hardly understand how beams can be produced with profit, when these heaviest of rolled masses have to be turned over at each pass, and when a quarter more than the necessary weight of rolls has to be shifted for each order.

We now come to the second objection to the three-high mill. As stated by Mr. WILLIAMS, it is, that accuracy in the section of a rail is "utterly impossible" in the three-high mill, and that this is due to the fact that the bottom roll is fixed, while the other two are movable. Mr. SNELUS attributes the inaccuracy, not to the three-high mill, but to the fact that the middle roll is not fixed; and he states that in a three-high mill, with fixed middle roll and movable top and bottom rolls, he has seen just as accurate rails produced as in the English two-high mill.

This objection, as we shall observe, is entirely without foundation. The inaccuracies of section mentioned must have, and may easily have arisen from other causes, one of them being that American rail makers do not dress off their rolls as often as English makers do. Again, the middle roll is sometimes improperly set endwise, and is allowed to have end play.

In respect of shape of groove, the two-high and three-high mills are precisely alike. Rolling a rail in a three-high mill is just the same as rolling it in two two-high mills. The shape and relation of the grooves in the bottom roll and the roll above it, in the two-high mill, and in the three-high mill are identical. The shape and relation of the grooves in the top and middle rolls of a three-high mill are identical with the shape and relation of the grooves in a two-high mill. Remove the top roll from Fig. 1, and you have left, a two-high mill, differing in no respect, as far as the shape and relations of the *finishing groove* are concerned, from a two-high mill. The finishing groove shapes the rail. Now to say that taking away the top roll, which does not touch the rail on the finishing pass, will alter its shape, is at least amusing.

Now as to the statement that the inaccuracy occurs because the middle roll is movable and the bottom roll fixed—take the finishing groove, in Fig. 1. The top roll has nothing to do with the rail on this pass, so we will remove it. We now, for the purposes of the finishing groove, have a two-high mill, in which the top roll is movable and the bottom roll is fixed, and this, we are told, is *wrong*. But it singularly happens that this is precisely the state of things with any and every *two*-high mill—the top roll being movable and the bottom roll fixed. And this, we are told, is *right*.

If any further statement is necessary to dispose of this objection, it is the fact that although the rolls in a three-high mill, as in a two-high, are capable of being moved, they are not moved while the rail is going through them; they are *all* fixed rolls, as much so as if their bolsters were cast in the housings. The fact that for the purpose of setting the roll, the middle roll *can* be screwed towards the bottom roll, or the bottom roll *can* be screwed towards the middle roll, has no more to do with the final shape of the rail, than the fact that the engine that drives the train is vertical instead of horizontal.

Finally, if the fixedness of the middle roll did have anything to do with the shape of the rail, it could be as well secured in the three-high mill as in the two-high. This MR. SNELUS admits, so that his objection is not to the three-high principle. Among our own rolling mill men, independent bolsters for all the rolls are getting into favor. Mr. GEORGE FRITZ's thirty-inch blooming mill at the Cambria Works, has a fixed middle roll. So has the steel train built by MR. WILLIAM A. SWEET, of Syracuse, and now running in his works. The splendid train constructing at Bethlehem by MR. JOHN FRITZ, is similarly arranged. In all these trains the top and bottom rolls are movable by screws. In the thirty-inch blooming mills erected by the author and now running at Troy and at North Chicago, the middle roll is movable by screws, and the top and bottom rolls are fixed. In all these mills, the rolls are set while the mill is running, and the same passes are used over and over. Another advantage of the independent bolster over the old three-high mill is that each roll journal has only the friction of its own roll to resist, while in the usual form of mill, the top roll rests on the journal of the middle roll, and the weight of all three rolls is borne by the journal boxes of the bottom roll.

Arsenic from Alkali Works.

By H. A. SMITH, F.C.S.*

SOME time ago the author laid before the Society the results of several analyses of the amounts of arsenic contained in different species of pyrites, and in several products in the manufacture of which the acid was employed. At that time he carried his analyses as far as the carbonate of soda, in which no arsenic was found. The present paper is supplementary to the former, and he now endeavors to show that not only does the arsenic remain in the various products of alkali manufacture, but even escapes to the atmosphere.

When the salt used for the production of hydrochloric acid is treated with sulphuric acid, containing arsenic, the arsenic present becomes converted into the trichloride. This compound is said to be completely decomposed by contact with water, so that, after passing along with hydrochloric acid gas through the condensing towers, it would be scarcely expected that any traces of the arsenic originally present would be found in the escaping gas. The author finds this, however, to be the case. A considerable quantity of the arsenic trichloride escapes the action of the water in the condensing towers, and passes, along with a very small portion of the hydrochloric acid gas, to the chimney.

A deposit found in the flue, about 20 feet long, leading from the salt-cake furnace to the condensing towers, the coke contained in the towers themselves, the gas in the flue leading to the chimney, and the smoke escaping to the chimney, were all submitted to analysis, and were all found to contain arsenic.

The results are gathered together in the following tables :—

TABLE I.

Deposit in Flue leading from Salt-Cake Furnace to Condensing Tower.

	Arsenic Trioxide per cent.
Mean of 9 analyses	=43·434

The total numbers in this case were found to agree very closely, varying only from 39 per cent. to 47·7 per cent. This flue had been worked for some years.

TABLE II.

Coke from Condensing Towers.

	Arsenic Trioxide per cent.
Mean of 3 analyses	2·886

In this case 10 lbs. of coke was used for each analysis, and was digested well, first with distilled water, and then with pure hydrochloric acid. The towers had been in use for about one year.

TABLE III.

Air in Flue leading from Condensing Tower to Chimney.

Amount of air taken for each analysis = 500 cubic feet.

Amount of air passing = 31·722 cubic feet per hour.

The mean of 12 analyses is here given.

Arsenic Trioxide per 1000 cubic feet. Grains.	Arsenic Trioxide per hour. Grains.	Arsenic Trioxide per day. Grains.
0·158	5·012	115·134

The arsenic will probably escape either as arsenious acid or as arsenic trichloride. If as the latter, it may be decomposed, on coming in contact with the atmospheric moisture, into arsenious and hydrochloric acid—

$$(2AsCl_3 + 3H_2O = As_2O_3 + 6HCl).$$

TABLE IV.

Specimens of Air, taken 10 feet from Bottom of Chimney.

Amount of air taken for each analysis = 500 cubic feet.

	Arsenic Trioxide per 1000 cubic feet.
Mean of 9 analyses	0·086

The author did not know the amount of air passing in the chimney, so he only calculated the amount of arsenic trioxide in grains per 1000 cubic feet.

The method employed for collecting the arsenic trioxide contained in the last two tables was very simple. The air was drawn through three bottles, containing respectively water, hydrochloric acid, and nitrate of silver. The gas was allowed to bubble very slowly through the solutions. The bottles containing them were capable of holding 40 ounces, and were filled about half full.

The idea of arsenic being present in the atmospheric surrounding chemical works is by no means new. The fact of its existence in large amounts in the ore from which the greater proportion of our vitriol is made leads one to suppose that it must find its way into the atmosphere at one place or another, but the author believes that this is the first time the comparative amounts have been brought forward.

*Read before the Manchester (Eng.) Literary and Philosophical Society.

The Manufacture of Iron and Steel.

By EDWARD RILEY, F.C.S.

Continued from page 258.

THE percentage of iron in the Norwegian titanic ore* is so low, and that of the titanic acid so high, that the amount of flux and fuel required to smelt it is very large. Practically, smelting titanic ores in this country is a failure ; this I clearly pointed out before the attempt was made. The ore contains from 40 to 45 per cent. of titanic acid, and yields in a bulk less than 30 per cent. of metallic iron. The best flux is dried clay or old bricks and limestone, so as to form a cinder to flux away the large excess of titanic acid. The furnace cannot be worked with a heavy burden of lime, as the titanic acid then forms a difficultly fusible cinder, consequently the iron is usually white, and mottled or grey iron is produced with difficulty.

I never could see how it could pay to bring an expensive material from Norway, containing more than 2-5 of its weight of a difficultly fusible mineral acid, and consequently a low percentage of iron, the titanic acid requiring a large amount of flux to run it away in the cinder, and necessarily a large quantity of fuel to melt it, when charcoal pig could be bought in this country at fully less than 20*s*. per ton than the titanic pig costs in making.

The virtues of titanium although extolled by Mr. MUSHET and others, and for a time thought favorably of by myself, are more than questionable. I believe there is no virtue whatever in titanium ; ilmenite may be useful for certain purposes, as a highly refractory material for lining furnaces, but even for this purpose its use will be limited on account of the effect it has of making iron cold-short.

In considering the quality of iron made from various ores, I have spoken generally, assuming that fuel of a fair quality was used. The quality of fuel is of even more importance than that of the ironstone, as even inferior ores when smelted with charcoal, make a good quality of pig iron. In the south of France I have seen spathose ore used, which contains a large percentage of pyrites. The ore is roasted with small charcoal, and then spread out and exposed to the air before using. The furnaces are worked rather heavy on limestone and the sulphur is all separated ; this I think, clearly tends to uphold my view, that the lime acts on the sulphide of iron.

Fortunately for this country our supply of coal is large, and much of it is of excellent quality. Many of the South Wales coals and the Staffordshire coals contain not more sulphur than ¾ to 1¼ per cent. Coals containing this amount, when used in the blast furnace, make an excellent quality of iron. The largest and most important district, viz., Northumberland and Durham, produces the most compact and densest coke in the kingdom, and supplies iron works with it at a distance of 150 miles.

From a very extensive experience in the examination of north country cokes, I may state, that the best cokes contain from 7-10 to 9-10 per cent. of sulphur, and from 5 to 8 per cent. of ash ; cokes containing from 9-10 to 1 2-10 per cent. would be considered of very fair quality ; above this the coke may be considered inferior. I have found as much as 3 per cent. in some north country coke. This coke was exceedingly hard and dense, some of the hardest I ever examined. In cokes from other districts I have found as much as 4¾ ; the coke was hard and bright, and, as far as could be judged from appearance, a good coke.

Coke containing say from 7-10 to 1 per cent. of sulphur is adapted for making the best descriptions of iron, and for Bessemer pig it may even be used up to 1¼ per cent. When the percentage amounts to 1¾ per cent. it is difficult to make No. 1 pig, unless a very heavy burden of limestone is used ; with 2 per cent. of sulphur great difficulty would be experienced in making No. 1 pig ; and with coke containing 3 per cent. of sulphur, it would be difficult to produce anything but white iron.

In considering the value of coke, not only the percentage of sulphur should be considered, but the state in which the sulphur exists. The most prejudicial form is when it occurs as sulphide of iron ; when the sulphur exists as sulphide of calcium, I believe it has no prejudicial effect on the iron. Large quantities of sulphur may be present in a blast furnace, as a sulphate of an alkaline earth, without having any effect on the quality of the iron produced. I have seen an iron ore smelted containing a very large percentage of sulphate of baryta. The ore in bulk would contain 15 to 20 per cent. of sulphate of baryta ; this was reduced to sulphide of barium, which floated on the pigs in the form of a matt containing some sulphide of iron ; the iron below was grey, and of good quality.

REFINED IRON.

Having given a hasty description of the various varieties of pig, I purpose passing on to the conversion of the pig into wrought iron.

The process of refining iron in the old finery is still carried on at some works ; it is, however, mostly superseded by what is known as pig-boiling, that is, puddling the pig directly instead of refined metal.

In refining iron it has been clearly shown by PRICE and NICHOLSON and others that the silicon is oxidised before the carbon, and in some cases silicon is separated completely from the metal, existing only as traces.

The time required to refine iron seems to depend on the amount of silicon present in the pig ; thus, grey iron requires much longer than white, and when very siliceous white iron or glazed grey pig is used, it is almost impossible to refine it. I have known white pig containing over 2 per cent. of silicon blown for seven hours, and then it was not metal. The finery cinder produced differs very much in appearance ; it contains 5 or 6 per cent. more silica than ordinary finery cinder from pig with a moderate amount of silicium in it.

With common iron, such as white Welsh or Staffordshire pig, the effect of overblowing is to convert the iron into a spongy porous mass, similar to what is known as a skull, whereas with best Yorkshire iron I have seen wrought iron on the top of the metal, the metal being quite solid. I cannot, however, say that the latter metal was overblown ; it may probable be due to the production of wrought iron near one of the tuyeres.

In refining, the larger portion of the silicon is separated, and some amount of sulphur and phosphorus with a little carbon. In considering the question as to the best composition of pig iron for refining, and the same will apply to puddling, I am decidedly of opinion that when pig contains much sulphur and phosphorus, and as a rule the percentage of carbon is low, it is advantageous to have a certain amount of silicon present, so that the silicon may be acted on before the carbon and give time for more of the sulphur and phosphorus to separate, whereas if there is but little silicon the carbon is attacked, the metal is soon sufficiently blown before you have separated any amount of sulphur and phosphorus. Time is an essential condition in their separation, and, with regard to the phosphorus, it is gradually oxidised by the oxides of iron present in the cinder, and converted into phosphate ; possibly some may separate as phosphide of iron ; the sulphur, most probably, is all separated as sulphide of iron.

TO BE CONTINUED.

*The above remarks refer to ilmenite.

THE COAL TRADE.

NEW YORK, Nov. 1st, 1872.

The result of the Scranton sale was a rise, though not so great as was hoped. Still the fact that there was a rise in all sizes but Steamer, shows the firmness of the market. The decline in that coal was merely a consequence of its previous abnormal position far above both lump and broken. The auction prices were:

		October.	September.	Rise.	Decline.
5000	Lump.....	$3 66	$3 66½	½c.	
7500	Steamer....	4 01½	4 16½		15c.
17500	Broken.....	3 90½	3 87½	3	
10000	Egg.....	4 15	4 04½	10¾	
20000	Stove.....	4 64½	4 30½	34½	
10000	Chestnut...	3 78½	3 70½	7½	

The Lehigh Exchange has made the following rates for November shipments at Elizabethport, Port Johnson, and Hoboken.

		Advance.
Lump	$5 00	none
Broken	4 75	15c.
Egg	4 75	15
Stove	5 10	30
Chestnut	4 15	15

The following will be the prices for coal of the Delaware and Hudson Canal Company on board vessel at Rondout.

		Advance.
Furnace, Lump	$4 00	none
Steamer, Lump	4 10	none
Grate	4 20	10c.
Egg	4 45	15
Stove	4 90	30
Chestnut	4 20	10

The market not only continues steady and firm, but is increasingly so. Some companies have sold out and under these circumstances it is inevitable that the talk of increasing the prices should continue. There seems to be a clique bent on pushing up the price, and with a market that bears so well the careful advances hitherto made, those who urge a rise are naturally strengthened. The rates for December began to be talked about almost before November had begun, but it is obviously much too early to expect anything like a definite feeling. The low stocks of coal in the hands of the great companies would make an advance now a mere matter of form.

In the city trade and doubtless too in the country business the prevailing horse disease has had its effect, though only a local and temporary one. There is an indisposition to take cargoes unless the prospect for immediate discharge is good. But considering the extent to which this disease has spread and the great dependence of the coal business upon horses, it is remarkable that the general trade shows no marked signs of the momentary dead lock in transportation. But it seems to suffer less than almost any other business.

The following circulars have been issued by the respective railroad companies.

Philadelphia and Reading: Circular No. 51. On and after November 4th, and until further notice, a drawback of forty cents per ton on lump and steamboat coal, thirty-five cents per ton on broken, egg, and chestnut coal, and twenty-five cents per ton on stove coal, will be paid on all Anthracite coal shipped from Port Richmond, and consigned to any points beyond the Capes of the Delaware, through the Chesapeake and Delaware Canal, or through or upon the line of Delaware and Raritan Canal; and no drawback will be paid on Anthracite coal consigned to any other point.

Circular No. 52. On and after November 4th, 1872, and until further notice, there will be paid a drawback of fifteen cents per ton on lump and steamboat coal; and ten cents per ton on broken, egg, and chestnut coal shipped from Schuylkill Haven and Port Clinton to New York and vicinity.

A drawback of twenty cents per ton will be paid on all coal shipped from Schuylkill Haven and Port Clinton to Philadelphia and vicinity.

Central Railroad of New Jersey.

From this date, until further notice, the following tolls per ton will be charged by this company, on coal shipments from Penn Haven, Mauch Chunk and Phillipsburg to the several tide points named.

	From Penn Haven.	From Mauch Chunk.	From Phillipsburg.
To Mauch Chunk	$0 12		
" Phillipsburg	0 84	$0 72	
" Elizabethport	1 90	1 78	$1 06
" Port Johnston	1 90	1 78	1 06
" Newark	2 26	2 14	1 42
" Hoboken	1 90	1 78	1 06

The rate on coal for way points on the New Jersey Railroads, will be $1 15 per ton from Mauch Chunk to Phillipsburg.

Bituminous Coal.

In this branch of the coal business there is quite as much activity and firmness as in hard coals. Prices are about the same—$6.65 at New York—but still firmer, There is a dearth of coals especially of gas coal, and the stocks of some of the gas companies are running low. From the Provinces heavy orders for West India and South America on English account are reported, and the reason they are taken there is that the coal cannot be had here. Considering the activity which now characterizes the trade in coal of all kinds and the steady increase of prices based on that activity as it has grown from week to week, the dealers may look forward to months of favorable trade, and possibly to still greater advances in price, though that is not immediately anticipated by the more cautious.

Anthracite Coal Trade for 1871 and 1872.

The following table exhibits the quantity of Anthracite Coal passing over the following routes of transportation for the week ending October 28, 1872, compared with the week ending Oct. 28, 1871.

COMPANIES.	1871. WEEK.	1871. TOTAL.	1872. WEEK.	1872. TOTAL.
*Phila & Reading R. R†..	157,975	4,639,139	140,524	4,834,538
*Schuylkill Canal	30,976	868,505	25,340	727,459
*Lehigh Valley R. R. ..	77,897	1,911,321	58,603	2,735,535
Lehigh & Sus. R. R.....	38,709	1,025,194	39,703	1,430,655
Lehigh Canal	31,593	609,413	25,577	677,754
Scranton North.....	19,978	437,400	25,789	650,843
" South	43,536	951,504	37,041	1,729,962
Penn. Coal Co., rail.....	25,633	586,086	25,937	997,904
" " " canal....	600	12,518	367	5,639
Del. & Hud. Canal Co....	33,858	840,966	39,679	1,255,217
" " East...	12,130	269,468	7,314	472,134
" " West..	3,773	93,822	11,460	342,137
" " South.	11,384	261,319	8,841	322,395
Shamokin.....	11,548	530,439	15,748	466,769
Trevorton.....	....	.....	....	....
Lykens Valley Coal Co....	2,038	78.420	..	2,085
Wyoming North.....	....	.....	....	....
Wyoming South.....	....	.....	....	....
P. N. Y. C. & R. R. Co..	....	104,987	12,843	526,580
Williamstown Col'y.....	....	.....	....	....
Big Lick Col...	3,016	122,746	....	10,591
Total.	504,634	13,363,247	474,761	17,188,147
1870.....	474,761			13,363,247
Increase	....			3,825,000
Decrease.....	29,873			

* These figures are for the week and fiscal period commencing Nov. 30

† Less coal transported for Company's use and Bituminous coal.

Bituminous Coal Trade, 1871 and 1872.

The following table exhibits the quantity of Bituminous Coal passing over the following routes of Transportation for the week ending Oct. 26, 1872, compared with week ending October 28, 1871.

COMPANIES.	1871. Week.	1871. Year.	1872. Week.	1872. Year.
C. & O. Canal.....	16,607	583,426	18,450	555,276
B. & O. R. R.....	24,522	1,021,621	26,163	1,030,894
H. & B. T. R. R.....	6,363	265,547	7,883	251,506
*Harrisburg & D.....	12,122	456,680	9,534	419,176
*L. V. R. R.....	9,842	334.064	673	24,431
P. & N.Y.C. & R. Co.....	....	.....	7,976	309,584
Cumberl'd Branch Canal	4,727	170,651	5,195	185,048
" Railroad....	1,151	58,444	727	18,125
Total.....	75,334	2,890,433	76,601	2,794,040
		2,794,040	75,334	
Decrease.....		96,393	.....	
Increase.....			1,267	

Report of Coal Transported over Central R.R. of N. J. (Lehigh and Susq. Div.)

Week ending October 26—Compared with same time last year.

WHERE SHIPPED FROM	WEEK 1872., tons ct.	WEEK 187., tons ct.	YEAR 1872 tons cwt.	YEAR 1871, tons.cwt.
Wyoming Region . .	38695 12	35120 18	1234265 03	1049724 07
Upper Lehigh Region .	4610 03	4296 02	167122 06	77595 14
Hazleton Region . . .	6954 01	10430 13	214917 12	172168 05
Beaver Meadow Region	3766 05	4547 09	133731 09	59889 09
Mauch Chunk Region .	7838 14	8141 07	366315 17	177372 18
Treskow Region.....				
Mahanoy Region . . .				
Totals . . .	61861 15	62236 09	2116552 07	1536750 13
Increase . .			579801 14	
Decrease . . .	471 14			
DISTRIBUTION.				
Forwarded East of Mch Chunk by Rail . .	39702 14	38703 15	1430654 14	1025194 00
Forwarded East of Mch Chunk by Canal. . .	15505 17	17250 03	435152 09	349341 18
Delivered at and above Mauch Chunk . . .	1787 17	1920 15	50534 14	51492 03
L. V. R. R at Packer'n	643 19	278 17	11192 17	204.8 13
Delivered to L. & B. R. R.at Plymouth Bridge	4224 08	4177 13	187327 13	81293 19
Totals . . .				
Of the above there was transported on acc'nt of L. C. & N. Co.....	15679 04	12309 14	547948 02	261696 12
W.-B. C. & I. Co.....	22808 09	20029 02	818244 03	705407 05
Totals	38287 13	32338 16	1366192 11	967108 17
Increase			399.88 14	
Decrease	5948 17			

Schuylkill Canal.

Report of coal transported over the Schuylkill Canal for the week ending Saturday, October 26, 1872.

	Tons. Cwt.
From Schuylkill Haven	24,552 00
" Port Clinton	788 00
Total for week.	25,340 00
Previously this year	702,119 10
Total...	727 459 10
To same time last year	668,694 17

Delaware and Hudson Canal Company.

Coal mined and forwarded by the Delaware and Hudson Canal Company for the week ending Saturday, October 26, 1872.

	WEEK.	SEASON.
North	56,761 01	2,127,327 17
South	8,841 09	322,395 06
Total 1872	65,602 10	2,449,723 03
Corresponding time in 1871:		
North	53,435 09	1,222,153 01
South	11,383 15	261,319 11
Total	64,819 04	1,483,472 12
Increase North		
Decrease North		
Increase South		
Decrease South		
Total increase 1872	783 06	966,250 11
Total decrease 1872		

Philadelphia & Reading Railroad and Branches.

COAL TONNAGE

For the Week ending Saturday, Oct. 26, 1872.

BY RAILROAD.—ANTHRACITE.

PASSING OVER MAIN LINE AND LEB. VAL. BRANCH.

	Tons. Cwt.
From St. Clair.	33,702 06
" Port Carbon.	4,606 01
" Pottsville.	2,149 10
" Schuylkill Haven.	28 852 08
" Pine Grove.	5,053 11
" Tamaqua.	17,858 07
" Harrisburg.	23 07
" Dauphin.	5,473 07
Total	97,721 17

FOR SHIPMENT BY CANAL.

Passing Frackville Scales	10,276 06
" Mill Creek "	2,215 05
" Schuylkill Valley Scales	501 06
" Mt. Carbon "	1,539 18
" Cressona "	10,838 10
" Pine Grove "	
" Tamaqua "	1,105 12
Total	26,476 17

SHIPPED WESTWARD VIA NORTHERN CENTRAL RAILROAD.

Passing Locust Gap.	2,508 19
" Shamokin.	5,505 10
" Herndon.	.....
Total	8,014 09

SHIPPED WEST OR SOUTH FROM PINE GROVE.

Via Schuylkill & Susquehanna R. R.	1,074 14
" Lebanon & Pine Grove Branch	866 18
Total	1,941 12

CONSUMED ON LATERALS.

From Frackville Scales.	730 15
" Mill Creek "	552 07
" Schuylkill Valley Scales.	523 08
" Mt. Carbon "	712 19
" Cressona "	680 17
" Pine Grove "	73 16
" Tamaqua "	1,126 17
Total	4,400 19

LEHIGH AND WYOMING COAL.

Received via Allentown, E. Penn'a Br.	199 08
" " Alburtis, " "	25 10
" " Oreland, G. & N. Br.	1,062 07
" " Connecting R. R.	.....
" " Willow Street R. R.	681 01
Total	1,968 06

BITUMINOUS.

From Harrisburg.	9,513 43
" Connecting R. R., G. & N. Br.	.....
" Junction R. R.	20 00
Total	9,533 13

COAL FOR COMPANY'S USE.

Anthracite	7,295 16
Bituminous	265 00
Total.	7,560 16

RECAPITULATION.

	Total for Week.	Corres-p'g week last year.	Increase and Decrease.
Passing over Main Line and Leh. Val. Branch	97,721 17	111,746 00	d 14,024 03
For Shipment by Canal	26,476 17	32,482 15	d 6,005 18
Shipped Westward via Northern Central R. R.	8,014 09	5,413 12	i 2,600 17
Shipped West or South from Pine Grove	1,941 12	2,701 01	d 759 09
Consumed on Laterals	4,400 19	4,405 13	i 995 06
Lehigh and Wyoming Coal	1,968 06	2,226 05	d 257 19
Total Anthracite paying freig't	140,524 00	157 975 08	d 17,451 06
Bituminous	9,533 13	12,122 08	d 2,583 15
Total of all kinds paying freig't	150 057 13	170,097 14	d 23,040 01
Coal for Company's use	7,560 16	6,856 01	i 704 12
Total Tonnage for Week	157,618 09	176,953 18	d 19,335 09
Previously this year	5348347 17	5139259 17	i 209,088 00
Total to date	5505966 06	5316213 15	i 189,752 11

SHIPPED BY CANAL.

From Schuylkill Haven	24,552 00	31,077 10	d 6,525 10
" Port Clinton	788 00	2,785 00	d 1,997 00
Total Tonnage per Week	25 340 00	33 862 10	d 8,522 10
Previous y this year	702,119 10	847,736 17	d 145,617 07
Total to date	727,459 10	881,599 07	d 154,139 17

Report of Coal Transported over Lehigh Valley Railroad

Report of coal tonnage for the week ending Oct. 26, 1872, with totals to date, compared with same time last year.

WHERE SHIPPED FROM.	WEEK. Tons. Cwt.	TOTAL. Tons. Cwt.
Total Wyoming	11,250 17	463 517 11
" Hazleton	43,360 11	1,991.006 07
" Upper Lehigh	1 9 09	2,098 13
" Beaver Meadow	16,459 19	695,273 05
" Mahanoy	8,054 13	342 .56 08
" Mauch Chunk	.7 03	2.516 00
Total	79,232 09	3,497,238 04
Same time last year	101,416 06	2.3-4.231 07
Increase		1,113,001 17
Decrease	22,133 17	
Forwarded East from Mauch Chunk by rail	58,602 15	2,735,585 00
Same time last year	77,897 01	2,911,020 09
Increase		824,264 01
Decrease	19,294 06	
DISTRIBUTED AS FOLLOWS.		
Forwarded East from Mauch Chunk by rail	57,727 13	2,694,092 10
do East for use L. V. R. R	874 16	41,492 10
Delivered at and above Mauch Chunk for use of L. V. R. R.	1 318 03	51,226 17
To P. & N. Y. R. R.	7,194 15	323.508 07
To N. C. R. R., at Mount Carmel		2,156 05
To D. H & W. R. R.	575 19	26,595 05
To L. & S. R. R. at Packerton for rail	361 07	11,790 18
Delivered at M'h Chunk	157 10	1,854 10
Delivered on line of road above Mauch Chunk	451 05	14,232 13
To L. S. & R. R., at Penn Hav., for railroad		4,011 19
Do. for canal	6 599 13	206.698 01
To Lehigh Canal Mauch Chunk	4,031 19	109,912 08
To Catawissa Railroad		9,625 16
Total	79,232 09	3,497,238 04

Penn. and N. Y. R. R.—Coxton, Pa.

Coal tonnage for week ending October 26, 1872.

	Week. Tons.	Cwt.	Total. Tons.	Cwt.
Anthracite received:				
From Lehigh Valley R. R.	7,194	15	323,508	07
" Lack. & B. R. R.	1,351	17	68,675	11
" Pleasant Valley R. R.	3,261	06	88,360	09
" Sul. & Erie R. R.	1,040	04	45,986	03
Total	12,848	02	526,530	10
Distributed:				
To Lehigh Valley R. R.	838	14	33,532	01
To Lack. & B. R. R.	5	12	1,051	00
To S. Central R. R.	3,275	16	99,771	09
To Ithaca & A. R. R.	1,609	19	81,296	12
To Erie R. W. Pockets for shipm't.	3,966	14	236,211	06
To individuals on line of road	985	01	20,153	05
To points at & above Coxton for use of Co	634	02	21,263	12
To points between Waverley and Elmira	1,532	04	33,251	05
Total	12,848	02	526,530	10
Bituminous received from BARCLAY R. R.				
Shipped north from Towanda	7,945	10	307,155	08
Shipped south from Towanda	30	07	2,166	12
Northern Central R. R.	....		262	00
Total	7,975	17	309,584	00
Distributed:				
To Erie Railway	6,791	03	276,476	18
To So. Central R. R.	1,149	07	30,423	07
To Ithaca Valley R. R.	....		120	03
Lehigh Valley, R. R.	....		1,201	01
To individuals on line of Railroad.	10	00	1,082	00
To points on line of road for use of Company	25	07	280	11
Total	7,975	17	309,584	00
Grand totals transported:				
Anthracite	12,848	02	526,530	10
Bituminous	7,975	17	309,584	00
Total	20,823	19	836,114	10

Lehigh Coal and Navigation Company,

Report of Coal transported over the Lehigh Canal and L. & S. Div of Central Railroad of New Jersey for the week ending Oct. 26, 1872, and for the year 1872.

	WEEK.	YEAR.
Forwarded East of M'ch Chunk by Rail	39,702 14	1,430,654 14
Delivered at and above do., ...	1,787 17	50,534 14
Forwarded East of do., by Canal	25,577 03	677,754 02
	67,067 14	2,158,943 10
Corresponding period last year—		
Forwarded East of M. Chunk by Rail..	38,708 15	1,025,194 00
Delivered at and above do., ..	1,920 15	54,492 03
Forwarded East of do., by Canal	31,533 09	609,413 06
	72,162 19	1,689,099 09
Increase on Railroad	861 01	401,503 05
Decrease " "	.....	
Increase on Canal	.....	68,340 16
Decrease " "	5,956 06	
Of the above there was transported on account of—		
Lehigh Coal Nav. Co	21,152 14	766,420 10
Wilkesbarre Coal & Iron Co.	22,608 09	818,244 09
	43,761 03	1,584,664 19
Corresponding period last year—		
Lehigh Coal & Nav. Co	21,606 11	482,094 04
Wilkesbarre Coal & Iron Co.	20,029 02	705,407 05
	41,635 13	1,187,501 09
Increase	2,125 10	397,163 10
Decrease	.....	.....

Delaware and Hudson Canal Company.

The following is a statement of Coal Transported by the Delaware and Hudson Canal Co. for the week ending Oct. 26, 1872.

	FOR THE WEEK.	FOR THE SEASON.
By Delaware and Hudson Canal,	39,679	1,255,217
By Railroad, East	7,314	472,134
" " West	11,460	342,137
" " South	8,841	322,395
Total Tons	67,294	2,391,883
For the same period last year.		
	FOR THE WEEK.	FOR THE SEASON.
By Delaware and Hudson Canal,	33,858	840,966
By Railroad, East,	12,130	269,463
" " West	3,773	93,822
" " South	11,384	261,319
Total Tons	61,145	1,465,575
Increase	926,308	

Delaware Lackawanna & Western Rail Road Company.

Coal transported on the Delaware, Lackawanna, & Western Railroad for the week ending Saturday, Oct. 26, 1872.

	WEEK. Tons.	Cwt.	YEAR. Tons.	Cwt.
Shipped North	25,758	17	650,843	05
Shipped South	37,041	01	1,729,961	16
Total	62,799	18	2,380,805	01
For the Corresponding time last Year:				
Shipped North	19,977	15	437,400	09
Shipped South	43,535	13	951,504	01
Total	63,516	08	1,388,904	10
Increase			991,900	11
Decrease	713	10		

Pennsylvania Coal Company.

Shipments of Pittston Coal for the week ending October 26, 1872.

	1872. WEEK.	YEAR.	1871. WEEK	YEAR
By Railway	25,956 15	997,903 11	25,632 13	586,086 05
" Canal	366 11	5,638 16	599 15	12,518 01
Total	26,323 06	1,003,542 07	26,233 08	598,604 06
Increase 1872.	404,938 01			

Statement of Coal Transported over Cumberland and Pennsylvania Railroad

During the week ending Saturday Oct. 26, and during the year 1872, compared with the corresponding period of 1871.

WEEK.

	To C. & O. Canal Tons.	Cwt.	To B. & O. R. R. C. Tons.	Cwt	Total. Tons	Cwt.
1872	18,449	11	26,163	01	44,612	12
1871	16,606	11	24,522	01	41,128	12
Increase	1,843	00	1,641	00	3,484	00
Decrease			.....			

YEAR.

1872	555,276	07	1,030,893	16	1,586,170	03
1871	583,426	08	1,021,620	14	1,605,047	02
Increase	.....		9,273	02		
Decrease	28,150	01			18,876	19

Cumberland Branch R. R.

WEEK.

	To C. & O. Canal. Tons.	Cwt.	To B. & O. R. R. Co. Tons.	Cwt.	Total. Tons.	Cwt.
1872	5,194	16	727	05	5,922	01
1871	2,967	12	1,151	04	5,877	19
Increase	468	01	.....		44	02
Decrease	.....		423	19	.....	

YEAR.

1872	185,047	13	18,125	04	203,172	17
1871	170,650	13	58,444	10	229,095	03
Increase	14,397	00				
Decrease			40,319	06	25,922	06

Northern Central Railway, Shamokin Division.

Below is the return of Coal sent over the Shamokin Division of the N. C. R. W., for the week ending October 26, 1872.

	Tons.	Cwt.	Tons.	Cwt.
East	2,853	12		
West	12,894	06		
			15,747	18
Same time last year			15,548	04
Increase			4,199	14
Decrease			.....	
Total amount shipped to date			466,708	15
Same time last year			530,438	19
Increase			.....	
Decrease			63,670	04

Lehigh Canal Coal Trade.

Shipped for the week ending October 25, 1872.

		Week. Tons.	Cwt.	Week. Tons.	Cwt.
Total from Mauch Chunk Region		5,473	10	218,472	08
" " Hazardville	"	795	10	5,267	06
" " Beaver Meadow	"	4,284	08	135,272	18
" " Mahanoy	"	628	16	10,507	02
" " Hazleton	"	6,599	13	206,141	16
" " Upper Lehigh	"	570	03	25,223	15
" " Wyoming	"	6,032	05	75,582	06
" " do do	Hazardville	792	18	1,286	11
Total		25,577	03	677,754	02
Corresponding week last year		31,533	09	609,413	06
Increase		.....		68,340	16
Decrease		5,956	06		

Prices of Coal by the Cargo.

[CORRECTED WEEKLY.]

	AT NEW YORK. November 1.		AT PHILADELPHIA. November 1.	
SCHUYLKILL.	K. A.	W. A.	R. A.	W. A.
Lump	$—	$—	— —	
Steamer	— —	— —	— —	— —
Broken	— —	— —	— —	
Egg	5 25	4 75	— —	— —
Stove	5 50	5 00	— —	— —
Chestnut	4 25	—	— —	
Pea	— —	— —	— —	— —
LEHIGH.				
Lump, (along side)	5 35	— —	— —	— —
Broken	4 60	— —	— —	— —
Egg	4 60	— —	— —	— —
Stove	4 85	— —	— —	— —
Chestnut	4 35	— —	— —	— —
Pea	— —	— —	— —	— —
SPECIAL COALS.				
Honey Brook, Le'h	W. A. 4 00@5 00		— —	— —
Spring Mountain	" " — —@— —		— —	— —
Sugar Creek	" " — —@— —		— —	— —
Sugar Loaf	" " — —@— —		— —	— —
Old Comp'y's	" " 4 00@5 15		— —	— —
Room Run	" " 4 00@4 50		— —	— —
McNeal	" " — —		— —	— —
Girardville	" " — —		— —	— —
Hill & Harris	" " — —		3 10@4 00	— —
Shamokin	" " — —		— —	— —
Lykens Valley	" " — —		— —	— —
Broad Top	" " — —		— —	— —
McMichael	" " — —		3 25@4 25	— —
Henry Clay	" " — —		— —	— —
Powelton	" " — —		— —	— —

Company Coals.

November, 1872.

	L.	Str.	Gra.	Eg.	Sto	Chest
*Scranton at E. Port	3 45	3 45	3 65	3 70	4 00	3 50
*Pittston at Newburg	3 80	3 80	3 80	3 80	4 00	3 80
*Lackawana at Weehawken	4 00	4 10	4 10	4 30	4 00	3 60
Wilk'b're at Hoboken	3 60	3 65	3 85	3 85	4 60	4 10
Old Co. Lehigh at Pt John'n	5 25	—	4 50	4 60	4 60	4 60
Lehigh at Eliz. Port	5 00	—	4 60	4 60	4 80	4 00

For freights to different points see "Freights."
To contractors only.

Prices at Baltimore—November, 1872.

Wholesale Prices to Trade.

Wilksbarre, by cargo or car load	$5 20@5 35
Pittston and Plymouth, do	4 90@5 15
Shamokin Red or White Ash, do	5 10@5 35
Lykens Valley Red Ash, do	6 00
Zerba Valley	
Treverton	
By retail, all kinds per ton of 2,240 lbs	6 50@8 00
George's Creek and Cumberland f. o. b. at Locust Point for cargoes	@4 75
Fairmont and Clarksburg gas f. o. b. at L. Point	6 00
BITUMINOUS COALS.	
Kittaning Coal Co.'s Phœnix Vein, f. o. b. at Phila	$
Lemon " " "	
Cumberland Vein Coal	
Consolidation Coal Co.'s on board	N. Y.
Maryland Coal Co	"

Prices at Georgetown, D.C., and Alexandria, Va.

November, 1872.

George's Creek and Cumberland f. o. b. for shipping $4 25@4 35

Prices at Havre de Grace, Md.

November, 1872.

Wilkesbarre and other White Ash for Cargoes	$ @5 00
Lykens Valley	@6 00
Shamokin Red or White Ash	4 75@5 00

Bituminous Coals (Cumberland).

Georgetown, F. o. b.	$4.25
Baltimore	4.65
New York	6.60

Prices of Gas Coals.

November, 1872.

PROVINCIAL.

Corrected weekly by Louis J. Belloni, Jr., 41-43 Pine st., N. Y

	Coarse	Slack.
Block House	$2 00	$1 00
Gowrie	1 75	— 80

Vessels are being chartered at $4 25.

Corrected by Bird, Perkins & Job, 27 South street.

	Coarse.	Culm of Coal.
Pictou nett	$2 25	1 25
Sydney	2 25	- 80
Lingan	1 75	- 80
Caledonia	1 75	- 80

A discount from the prices of the coarse Coal on purchase of 5000 tons and upwards. Duty on all slack coal or Culm: 40c. per ton of 28 bushels, 80 pounds to the bushel. On all bituminous coal or shale: 75 cents per ton of 28 bushels.

AMERICAN.

	Currency.
Westmoreland	$7 10 @— —
Fairmount Gas Coal Co. of N. Y.	7 00 @— —
Despard Coal Co	7 00 @— —
Penn	7 10 @— —
Newburg Orrel Gas	— — @— —
West Fairmount Gas Coal	7 00 @— —
AT PHILADELPHIA.	
Westmoreland	7 00 @— —

Prices of Foreign Coals.

November, 1872.

Duty 75 c. per ton.

Corrected weekly by ALFRED PARMELE, No. 32 Pine street, N. Y.

Liverpool Gas Caking	$ 8 00@— —
" Cannel	12 00@13 00
" House	19 00@20 00
" Orrel	14 00@16 00

Per ton 2,240 lbs., ex-ship.

PRICES FROM YARD.

Liverpool House Orrel, screened	$16 00@18 00
"Cannel, "	19 00@23 00

Per ton 2,000 lbs. delivered.

Freights.—November, 1872.

TO EASTERN PORTS.	Cumberland. From Georgetown.	From Baltimore	Anthracite. From Philadelphia.	From Elis. Port, Port Johnston, and Hoboken.	From Newburgh.	From Rondout.
Amesbury		2 75				
Bangor		2 75				
Bath	2 75	2 75				
Boston	2 65	2 50		2 00	2 30	2 40
Bridgeport	2 25	2 30		1 00	1 25	1 30
Bristol				1 45	1 65	
Cohasset Nar'ows	2 70					
Derby	2 50			1 25	1 40	
Dighton	2 35					
East Cambridge				2 00		
Fall River	2 30	2 35		1 45	1 65	1 70
Hackensack						
Hartford	2 50	3 00		1 60	1 70	1 75
Hoboken	2 00			60	60	65
Jersey City	2 00			60	60	65
Lynn				2 00	2 30	2 70
Middletown				1 45	1 55	1 60
Mystic		2 75			1 55	1 60
New Bedford	2 35	2 50		1 45	1 65	1 75
Newburyport	2 50	2 75		2 25	2 45	2 55
New Haven	2 25	2 30		1 00	1 25	1 30
New London	2 20	2 40		1 30	1 45	1 50
Newport	2 30	1 90		1 45	1 65	1 70
New York	2 10	2 00		60	60	65
Norwalk	2 50	2 50		1 00	1 25	1 30
Norwich	2 40	2 40		1 40	1 55	1 60
Pawtucket		2 60		1 55	1 70	
Portland	2 70	2 60		1 95	2 35	
Portsmouth, N. H	2 85	2 75		2 20	2 45	2 50
Providence	2 30	2 30		1 45	1 65	1 70
Rockport						
Saco						
Sag Harbor		3 00		1 30	1 50	
Salem	2 70	2 65		2 10	2 35	2 40
Stamford				1 00	1 25	
Stonington				1 35	1 45	1 55
Taunton				1 95	2 15	
Warren				1 45	1 65	
TO RIVER PORTS						
Albany	3 00	2 40				
Catskill						
Cocksackie						
Coeyman's						
Cold Spring	2 30	2 25				
Fishkill						
Haverstraw	2					
Hudson	2 30	2 30				
New York						
Nyack	2 25					
Poughkeepsie	2 25					
Rhinebeck						
Rondout						
Saugerties						
Sing Sing						
Stuyvesant						
Tarrytown						
Troy	3 00	2 50				
West Point						
Yonkers						

Rates of Transportation to Tide Water.

BY RAILROAD.

TO PORT RICHMOND, PHILADELPHIA.

Philadelphia and Reading Railroad, from Schuylkill Haven for consumption ($1 85 less 55c. drawback	$1 30
For reshipment	1 75

MAUCH CHUNK TO ELIZABETHPORT.

L. V. Railroad from Mauch Chunk to Phillipsburgh	$0 66
C. R. R., N. J., Phillipsburgh to Elizabethport	0 98
Shipping expenses at Elizabethport	25
Wharfage	10
Total	$1 99

MAUCH CHUNK TO PORT JOHNSON.

L. V. R.R., or L. & S. R.R. from M. C. to Phillipsb'g	$0 66
C. R. R., of N. J., Phillipsburgh to Pt. Johnson	0 98
Shipping expenses	25
Wharfage	
Total	$1 99

TO HOBOKEN	
L. V. R. R., Mauch Chunk to Phillipsburgh	66
Morris & Essex R. R. Phillipsburgh to Hoboken,	0 98
Shipping expenses	25
Wharfage	
Total	$1 99
TO SOUTH AMBOY.	
L. V. R. R.	66
B. & D. R. R. & Cam. & Am. R. R.	98
Shipping Expenses	25
Total	$1 99
PENN HAVEN TO ELIZABETHPORT.	
L. V. R R. Penn Haven to Phillipsburgh	0 70
C. RR. of N. J. Phillipsburgh to Elizabethport	0 98
Shipping expenses	25
Wharfage	10
Total	$1 99

Foreign and Provincial Freights.

November 1872.

Foreign.

Newcastle and Ports on Tyne, per keel of 21 1-3 tons £
Liverpool, 5 per cent primage

TO NEW YORK.

Provincial.

Sydney	$3 05
Lingan	3 50
Cow Bay	3 75
Port Caledonia	3 10
Little Glace Bay	3 00

TO BOSTON.

Sydney	3 00
Lingan	3 00
Cow Bay	3 00
Port Caledonia	3 00
Little Glace Bay	2 90

MARKET REVIEW.

NEW YORK, Oct. 31, 1872.

IRON.—The market for Scotch Pig has been active since our last, the near approach of the closing of canal and river navigation stimulating buyers into laying in stocks for the Winter. Some importers refuse to accept present prices, as the advices from the other side point to a likely diminished production, consequent upon the locking out of the workmen in some foundries, and a generally unsettled market, prices falling and rising 10 a20 shillings per day, while all accounts agree in saying that but small stocks are on hand. The sales are 300 tons Monkland, to close a shipment, at $51a52; 100 do. same, $48; 400 do. same, of poor quality, at Philadelphia to go into the interior of Pennsylvania, $48; 120 do. No. 1 Glengarnock, $53a54; 150 do. No. 1 Gartsherrie, $55a56; and 150 do. No. 1 Carnbroe on private terms. American is quiet. There is no effort to push sales, the stock being light, and any sales that are made are at full figures. We notice 200 tons No. 2 X Crane at $53, and 200 do. Gray Forge, on private terms. New English are steady at $73a74 gold, without sales. Old have met with more inquiry, about 2000 tons having changed hands, on terms we did not learn. We quote nominally $46a47 gold, and $52a53 currency. Scrap is steady at about $45 from dock, and $46a47 from yard; 150 tons Wrought from dock sold at $45; 500 do. from yard and dock, on private terms; and 2000 do. for shipment to Philadelphia at $45. Refined Bar from store is steady at our quotations.

LEAD.—Pig is dull, as it is impossible to ship goods during the present horse epidemic; we quote Common Foreign $6.62½a6.65. For the fine brands, used for corroding purposes, no exact figures can be given, as most of the transactions are kept private; we quote them not less than seven cents. Selected Stolberg is firm at $6.80, all gold.

COPPER.—New Sheathing is steady at 43 cents, and Bolts and Braziers 45. Bronze and Yellow Metal Sheathing 27, and Y. M. Bolts 32, net cash. Ingot is dull, and where parcels are forced on the market our quotations cannot be realized. The sales embrace 150,000 lb. Lake, in lots, at 32a32¼ cents, mostly 32; 125,000 lb. for January and February delivery, 33; 100,000 lb. on private terms; and 50 tons English at and about 29 cents cash.

Yellow Metal Sheathing imported for ship-building will be allowed the benefit of the recent act of Congress, but no rebate on account of imported Copper will be allowed to American manufacturers of such metal.

SPELTER.—Silesian is again higher in Europe, but the demand here is light. We quote nominally $6.75a6.87½ gold. Domestic 8½c. currency.

TIN.—The stagnation in Pig continues, and, with the absence of demand, prices droop. We lower our quotations, though they are still nominal. Banca may be quoted 36 cents, Straits 32½, and English 32—all gold. Plates are also neglected, the business being only in a small jobbing way; prices are weak, and we reduce our figures 25a50 cents per box gold, and now write them nominally, I. C. Charcoal Tin, $12,25a12,50; I. C. Coke, $10.50a11; Coke Terne, $9.50a10; and Charcoal Terne, $10.75a11.25—all gold.

SINGAPORE, Sept. 6.—(McClaine, Frazer & Co.)—Tin has continued to be steadily taken for London and America 36.75a37 per picul for ordinary chops, while the one most favorite in China has been purchased by the Chinese at $37.75a38 per picul.

PENANG, Sept. 7.—Supplies of Tin have been moderate. For the London market there has not been much demand, but American orders have kept up the price at $32.80a36.50 per picul, at which about 150 tons have been purchased, the latter being the closing price.

ZINC.—Sheet is quoted nominally at 11½ gold; Manganese black oxide 4½c. currency; Gray peroxide 5½.

From the following comparison of returns of the British Board of Trade for the months of September 1871 and 1872 it will be observed that our importations show an aggregate decline from last year of over 15,000 tons, Rail Road Iron showing the largest decline of any item in the list, while in Pig Iron our imports this year exceed that of last year by nearly 4000 tons. These figures indicate beyond any question that we are gradually becoming independent of English products, showing as they do that, while our demand for Iron is steadily increasing, our production of the same more than keeps up to that demand, and possibly the day is not very far distant when the Trade returns will show a balance on the opposite side of the ledger.

	Sept. 1871.	Sept. 1872.
Pig Iron	tons.12,963	tons.16,602
Bar, Rod, Angle, &c.	5,673	4,283
Railroad Iron	54,373	37,732
Hoop, Sheet, Boiler, &c.	3,875	2,931
Cast Iron	1,130	901
Steel	1,506	1,308
Total	79,620	62,757

From Ryland's Iron Trade Circular dated London, Oct. 19, 1871, we learn that the average price of Pig Iron for the quarter just ended, shows a large increase over that of the same quarter last year, viz., £2 16s. 5d. An analysis of the average shows that for July the price per ton was £5 6s. 4d.; in August it increased by 10s. per ton, or to £5 16s. 4d.; and in September it amounted to £5 19s. 11d. or say £6. It will thus be seen, whatever may be the condition of affairs in other departments that Pig Iron has at all events maintained its value, although the quantity exported has sensibly diminished all through the quarter.

The average price per ton of Hoops, Sheet and Boiler Plates for the quarter of 1370 was £11 12s. 0d., for that of 1871 £11 10s. 8d., and for that just ended £17 11s. 2d., showing an increase of £6. The proportion of value to quantity was less in the quarter for 1871 than for that of 1870; but, although the figures for the quarter of 1872 show a decrease in total quantity, and a large increase in total value over 1871, the figures for the separate months comprising the quarter, indicate a steady increase, both in quantity and value. The average price per ton in July having been £16 8s. 0d., in August £17 11s. 9d., and in September £18 11s. 1d. Taking the figures roughly they show an increase of £1 per ton per month in average value with no corresponding decrease in quantity.

The average price per ton of Bar, Bolt, Angle and Rod Iron during the quarter of 1870 was £8 4s. 8d., during that of 1871 £8 8s. 0d., and during that of 1872 £12 12s. 0d., showing an increase of £4 4s. over the corresponding quarter. The averages for the months of the quarter just ended were as follows:—For July £12, for August £13 13s. 2d. and far September £13 14s. 1d. Thus, while the quantity steadily decreased during the quarter, the average price has improved to the extent of 13s. per ton in August over July, and the further extent of £1 8s. 0d. in September over August.

METALS.

NEW YORK, October 31, 1872.

IRON.—Duty: Bars, 1 to 1¼ cents ₱ lb; Railroad, 10 cents ₱100 lbs.; Boiler and Plate, 1½ cents ₱ lb; Sheet, Band, Hoop, and Scroll, 1¼ to 1¾ cents ₱ lb; Pig, $7 ₱ ton; Polished Sheet, 3 cts. ₱ lb; Galvanized 2½; Scrap Cast, $6; Scrap Wrought, $8 per ton. All less 10 per cent. No Bar Iron to pay a less duty than 35 per cent. ad val.

	Store Prices.
Pig, Scotch—Coltness ₱ ton	— —@— —
Gartsherrie	55 00@56 00
Glengarnock	53 00@54 00
Eglinton	52 00@52 50
Pig, American, No. 1	53 00@55 00
Pig, American, No. 2	50 00@52 00
Pig, American, Forge	42 00@47 00
Bar Refined, English and American	115 00@120 00
Bar Swedes, assorted sizes, gold	120 00@130 00
	Store Prices, Cash.
Bar, Swedes, 1¾ to 5 x ⅜ & ⅜ 2 sq. & 6 to 12 x ⅜ & ½	145 00@155 00
Bar, Refined, ¾ to 2 in. rd. & sq. 1 to 6 in. x ⅛ to 1 in.	— —@120 00
Bar, Refined, 1¼ to 6 by ¼	125 00@— —
Bar, Refined, 2⅛ to 2⅞ round 1 & 1¼ by ¼ & 5:16	127 50@— —
Large Rounds	127 50@140 00
Scroll	140 00@170 00
Ovals and half-round	140 00@160 00
Band	— —@135 00
Horse Shoe	130 00@140 00
Rods, ⅜ to 3-16 inch	125 00@165 00
Hoop	145 00@190 00
Nailrod	@ 9
Sheet, Russia, as to assortment (gold)	16½@ 17
Sheet, Singles, D. and T. Common	—7½@— 8½
Sheet, D. and T. Charcoal	—8½@— 9
Sheet, Galv'd, list 10 per cent, discount	—@— —
Rails, English (gold), ₱ ton	73 00@ 74 00
Rails, American, at Works in Pennsylvania, currency	80 00@— —

COPPER.—Duty: Pig, Bar, and Ingot, 5; old Copper 4 cents ₱ lb; Manufactured, 45 per cent. ad val.

	All Cash.
Copper, New Sheathing, ₱ lb	— @— 43
Copper Bolts	— @— 45
Copper Braziers, 16oz. and over	— @— 45
Copper Nails	— @— 45
Copper, Old Sheathing, &c. mixed lots	26 @— 28
Copper, Old, for chemical purposes, 14@16 oz.	— @— —
Copper English Pig	29 @— —
Copper, American Ingot	32 @— —
Yellow Metal, New Sheathing & Bronze	— @— 27
Yellow Metal Bolts	— @— 32
Yellow Metal Nails	27 @— 30

LEAD.—Duty: Pig, $2 ₱ 100 lbs.; old Lead, 1½ cents ₱ lb; Pipe and Sheet, 2½ cents ₱ lb.

Galena, ₱ 100 lbs	$— — @— —
Spanish (gold)	— — @6 62½
German, do.	— — @6 62½
English do.	6 62½@7 00
Bar (net)	9 25 @ —
Pipe (net)	— — @11 00
Sheet	— — @11 00

Colwell, Shaw & Willard Tin-Lined Lead Pipe 16½ cts. ₱ lb.

STEEL.—Duty: Bars and Ingots, valued at 7 cents ₱ lb or under, 2¼ cents; over 7 cents and not above 11, 3 cents ₱ lb; over 11 cents, 3½ cents ₱ lb, and 10 ₱ cent ad val. (Store prices.

English Cast (2d and 1st quality) ₱ lb	— 18 @— 22
English Spring (2d and 1st quality)	— 9½@— 10½
English Blister (2d and 1st quality)	— 11½@— 16
English Machinery	— 11½@— 14
English German (2d an 1st quality)	— 11½@— 12
American Blister "Black Diamond"	— — @— 11½
American, Cast, Tool do.	— — @— 17
American, Spring, do.	— — @— 11
American Machinery do.	— — @— 11¼
American German, do.	— 9 @— —

TIN.—Duty: Pig, Bars, and Blocks, 15 ₱ cent. ad val.; Plate and Sheets and Terne Plates, 25 ₱ cent.; Roofing 25. ad val.

	Gold ₱ lb.
Banca	36 @—
Straits	— @32½
English	— @32

PLATES.

Fair to Good Brands.	*Gold.*	*Currency.*
I. C. Charcoal, ₱ box	$12 25 @12 50	$14 25 @14 75
I. C. Coke	10 50 @11 00	12 00 @12 50
Coke Terne	9 50 @10 00	11 00 @11 50
Charcoal Terne	10 75 @11 25	12 50 @13 00

SPELTER—Duty: In Pigs, Bars & Plates, $1.50 p. 100 lb

Plates, Foreign (gold) p. 100 lb.	6 62½@6 87½
Plates, Domestic p lb.	8½@— 10½

ZINC—Duty: Pig or Block, $1.50 per 100 lb.; Sheet 2½c. per lb

Sheet per lb.—	10 @ 10½

San Francisco Stock Market.

BY TELEGRAPH.

NEW YORK, Oct. 31, 1872.

We have advices from the San Francisco Stock Board dated the 29th inst., with the exception of a slight decline in Savage and Crown Point, the market has advanced. Raymond and Ely is $15 higher than per last report. Yellow Jacket, however, does still better, having gradually advanced from $88 to $107, during the operations of the week. We have also appended the report of the 24th inst.

	Oct. 24.	Oct. 29
Savage	104	98
Crown Point	118	123
Yellow Jacket	102	107
Kentuck	225	—
Cholar Potosi	58	63
Gould & Curry	166	190
Belcher "New Issue"	96	104
Imperial	6⅞	10¾
Raymond & Ely	128	145
Meadow Valley	27	27½

American Institute of Mining Engineers.

OFFICIAL BULLETIN.

Announcements to Members and Associates.

I. The dues for the year ending May, 1873, are now payable. All members and Associates who have not paid their dues are requested to do so at once, by sending in postal orders, or checks, or money, ten dollars to the Secretary.

All members and Associates who pay their dues for each current year, strictly in advance, will have sent to their address, regularly and weekly, the ENGINEERING AND MINING JOURNAL, which is the organ of the Institute, and will contain the proceedings and transactions, and all important papers read before the Institute and all notices of meetings. Back numbers cannot, as a general rule, be sent.

II. It is expected that the more important papers read before the Institute, and the debates thereon, will be published in annual or occasional volumes to which those Members and Associates will be entitled who have paid their dues.

III. All authors of papers are requested to notify the Secretary in advance of the meetings, giving the subject and length of their papers. Attention is also called, in this connection, to Rules 12 and 13.

IV. The ninth rule has been amended, so that there will be hereafter three meetings a year, in February, May and October.

Wilkesbarre, Pa. MARTIN CORYELL, Secretary.

MISCELLANEOUS.

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29, 31, 33 Park Place,

Oct. 29:3m NEW YORK.

Fluid-Pressed Steel.

Sir JOSEPH WHITWORTH has taken up the subject of pressing steel while fluid in order to secure solidity, his object being to obtain perfectly sound castings for guns. His conclusions are given in an interesting paper from which we extract all that he says on the pressing of the fluid metal. Starting from the proposition that steel is the best material for heavy guns, he says :

"The primary condition being that the steel used for guns should be absolutely sound, the next condition is that it should possess sufficient ductility ; and, in order to obtain steel having the requisite ductility, and which can also be depended upon for being absolutely sound, it is necessary to apply extreme pressure to the metal when in a fluid state.

DEFECTS OF CAST STEEL.

"When highly carburised steel (such as tool steel) is cast in small ingots, and the air and gases escape readily by what is termed "piping," it is well known that about two-thirds only of the length of the ingot will be sound and free from air-cells. If an attempt be made to cast a very large ingot of highly carburised steel, the lower portion may appear sound, as in the smaller ingot, but a new defect and difficulty arises from the fact that the material may crack and destroy itself in the act of cooling.

"The outside of the ingot sets first, and the inside portion is therefore exposed to a great strain while cooling ; this strain may cause some part to crack or become unsound by reason of the hard unyielding character of the metal.

"It may be shown by experiment that steel which is so ductile that it will elongate from 30 to 35 per cent. before breaking will bulge and tear under the action of pressure, and will not fly into pieces. In order to ensure this ductility the amount of carbon present in the steel must be comparatively small.

"The ductility of tool steel, which is highly carburised, ranges from two to ten per cent.

"When steel (having the small amount of carbon necessary to give it a ductility represented by 35 per cent. of elongation) is cast into a large ingot, it is found in practice that nearly the whole length will be subject to honey-comb or air-cells, and will be unsound. This will be shown by a photograph of the large ingot.

"The conclusion is, that if the steel be soft, the presence of air-cells renders it unsound ; if it be hard, there is the danger of cracking, and in neither case can a steel gun of the ordinary manufacture be relied on.

HOLLOW CYLINDERS OF FLUID COMPRESSED STEEL.

"I have stated that the difficulty of obtaining a large and sound casting of ductile steel has been overcome by applying extreme pressure to the fluid metal.

"The castings used for guns are made in the form of hollow cylinders, and the steel is subjected, when in a fluid state, to a pressure of from 8 to 20 tons on the square inch ; the air and gases are driven out from the inside as well as the outside of the cylinder, the hollow form favors both the cooling and the escape of the gases, and the result is that the metal is compressed into a perfectly solid and homogeneous body, absolutely sound, free from air cells, and uniform both in strength and ductility.

"Within five minutes after the pressure is applied, the fluid column will be shortened by 1½ inches per foot of length. This fact will give some idea of the quantity of air which has been expelled, and which, if present in the metal, would have caused unsoundness.

"When ductile steel is cast under a pressure of eight tons per square inch, although sound and free from air cells, it is deficient in strength, and requires to be drawn out and forged in order to develope in a higher degree the strength and ductility of the material.

"With a pressure of 20 tons on the inch, the fluid compressed steel becomes as strong and as ductile as if it had been forged.

"In the manufacture of compressed steel guns, I draw out and forge the hollow cylinders after they have been cast under pressure."

Mr. WHITWORTH's new metal was put to severe tests in one of which a cylinder, 21 in. long and 10 in. external diameter, having a bore of 2,722 in., representing the chamber portion of a 9-pounder field gun, was charged with 1¼ lb. of R.L.G. powder. One end of the bore was closed by the shot being screwed in, and the other by a steel plug, also screwed in. The vent was of steel, the touch-hole being only one-tenth of an inch in diameter. This charge thus enclosed was fired, and the whole discharge escaped with a loud hissing report through the touch-hole, which was enlarged to double its original diameter. The steel cylinder, weighing over 3½ cwt. was driven forward like a rocket for 32 in. by the outrush of the gas against the air. The cylinder was not injured, nor even distended, and the plugs were easily unscrewed after the discharge.

Extraction of Silver by Iodine.

THE spent or burnt pyrites (Spanish and Portuguese) contains from 0·0020 to 0·0028 per cent. of silver (equal to from 20 to 28 grms. to the ton), and, in addition, a small quantity of gold ; the extraction of these small quantities might at first sight appear futile, but, as the quantity of pyrites burnt in Great Britain alone amounts annually to between 400,000 and 500,000 tons, the extraction of the precious metals therefrom is of importance. The iodine process is in successful operation in a factory established by F. Claudet and Mr. J. Phillips at Widnes, near Liverpool ; the process is based upon the insolubility of iodide of silver in a solution of chloride of sodium at the ordinary temperature The burnt pyrites is first ground to powder, sifted, and next gently ignited with some common salt ; the ignited mass is, after cooling, treated with dilute hydrochloric acid, and a sufficient quantity of iodide of potassum is added to the clear liquor. In the dry state, the precipitate formed consists, in 100 parts, of—silver, 5·95 ; gold, 0·06 ; lead, 62·28 ; copper, 0·60 ; oxide of zinc, 15·46 ; oxide of iron, 1·50 ; lime, 1·10 ; insoluble residue, 1·75 ; loss and oxygen, 3·62. In the year 1871, at the works above mentioned, 16,300 tons of spent pyrites were operated upon, yielding 333·242 kilos. of silver and 3·172 kilos. of gold, the net value of which, after deducting expense of refining and the loss of 137 kilos. of iodine, was £3,230.

The Relation of Agriculture to Civilization.

TO THE EDITOR—SIR :—Allow me to make a few statements relating to a criticism upon the paper on the Relation of Agriculture to Civilization, which I read before a learned society of this city, and which you reported last week. The criticism referred to appeared in No. 17 of MOORE's *Rural New Yorker*, an agricultural journal published in this city. It is said there that my paper "was little more than a compilation from old books, to prove that the decline of civilization had followed the decline in agriculture—the exhaustion of the soil."

In response to this rather sweeping assertion, permit me, Mr. Editor, to enumerate the books mainly used by me in preparing my lecture. They are :

Justus von Liebig. Chemische Briefe, 4th ed. 2 vols., 1859.

" Die Chemie in ihrer Anwendung auf Agricultur und Physiologie. 8th ed., 2 vols., 1865.

H. MARON. Bericht über die Japanische Landwirthschaft, 1862.

Von THIENEN-ADLERSTEIN. Bilder aus Spanien, 1864. (Very likely still unknown to the critical editor of the *Rural*.)

I have besides drawn facts from the yearly reports of the Commissioners of Agriculure up to date, and from Sir MORTON PETO's Resources and Prospects of America.

These are the "old books" I have used. The editor of the *Rural* denies further, that I proved the exhaustion of the soil to be the cause of the decline of a nation, but fails to give reasons for thinking so. From the nature of the subject, it is evident that my remarks could only relate to periods of time, within which we are able to trace that exceedingly slow process of the rise and fall of a people. Hence, it could not be my purpose to show that it follows that the civilization of New York has deteriorated, because she does not produce as much wheat per acre as she did twenty years ago, as that gentleman expected from me. But, what I think I did prove, and what was acquiesced in by the majority of the speakers was, that "no nation on earth, however powerful she may have been, has been enabled to exist, unless she could preserve the fertility of her soil." I invite the editor of the rural gazette referred to, to first study the above books, and then to take up any sentence of my paper, and to disprove it, if he can. If, in his opinion, the discussion which followed did not betray any ability on the part of the speakers, why did he—being present—not give evidence of his superior intellect ? By giving space to these few lines, you will, Mr. Editor, greatly oblige,

Yours, &c. ADOLPH OTT.

The Northern Pacific.

The War Department has received from Captain S. C. Kellogg, of the 5th United States Cavalry, an official report of the military expedition which recently accompanied the surveying party of the N. P. R. R. from the point in Dakota where that road crosses the Missouri River to the crossing of the Yellowstone River in Montana, near the mouth of the Powder River.

The expedition ascended the valley of Heart River, a tributary of the Missouri, crossed the low divide between the Missouri and the Yellowstone, and followed down the valley of O'Fallon's Creek to the Yellowstone River. The mouth of Powder River was reached on August 18, where a salute was fired, and the expedition prepared to return eastward. The return march was made at the rate of four or five miles per day, which enabled the engineers to make careful surveys and effect a final location of the railroad line across the section of the country referred to, being a distance of about 235 miles. A practicable and excellent route was found without difficulty, and without any serious divergencies from a straight line. The river valleys along which the line mainly runs were found to be uniformly fertile, and the "bad lands," which are represented on most maps as covering a large part of the region traversed, were almost wholly avoided by the route taken. Grass was abundant all the way from the Missouri to the Yellowstone, and good water was found at convenient intervals during the entire march. Extensive beds of lignite and semi-bituminous coal were found at frequent intervals for a distance of 150 miles. Timber exists in considerable quantities, especially in the river valley, and consists mainly of oak, ash, and cottonwood. The expedition was made without accidents or mishaps of any kind, and resulted, as above stated, in the discovery and location of an excellent railroad route.

AT the iron works and collieries in the Merthyr and Aberdare districts in Wales, a notice to terminate all existing contracts at the end of four weeks was issued in the first week in October ; and, upon good authority, it is said that the same thing has been done at every establishment in Glamorgan and Monmouth.

IT is reported that two new Bessemer works are contemplated in Pittsburgh, one in the Mahoning Valley in Northwest Pennsylvania, one in the same valley near Cleveland, one by Cincinnati capitalists, and three in Indiana, including one in connection with the Indianapolis Rolling Mill.

OF 487 railroads in the United States, 307 have a gauge of four feet and eight and one-half inches, and the remaining 180 vary in gauge from three feet to six feet. Between these extremes (and including them) there are no fewer than eighteen other gauges operated.

THE ENGINEERING AND MINING JOURNAL.

ROSSITER W. RAYMOND, Ph. D.,
JOHN A. CHURCH, E. M.
Editors.

PUBLISHERS' ANNOUNCEMENT.

THE ENGINEERING AND MINING JOURNAL *is projected in the intent of furthering the best interests of the Engineering and Mining public, by giving wide circulation to original special contributions from the pens of the ablest men in the professions. The careful illustration of new machinery and engineering structures, together with a summary of mining news and market reports, will form a prominent feature of the publication.* It is the Organ of the American Institute of Mining Engineers, and is regularly received and read *by all the members and associates* of that large and powerful society, *the only one of the kind in this country.* It is therefore the best medium for advertising all kinds of machinery, tools and materials used by engineers or their employees.

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CONTENTS FOR THIS WEEK.

American Institute of Mining Engineers—Pittsburgh Meeting	289
Three-high Rolls	290
Arsenic from Alkali Works	292
The Manufacture of Iron and Steel	292
THE COAL TRADE	293
THE MARKET REVIEW	295
American Institute of Mining Engineers	295
Advertisements	295
Fluid-Pressed Steel	296
Extraction of Silver by Iodine	296
The Relation of Agriculture to Civilization	296
The Northern Pacific	296
EDITORIALS:	
Official Outrages	297
A Threatened Removal	297
New Publications	298
An Official Outrage	298
Working Men in the United States	299
Our National Industry	299
MINING SUMMARY:	
California	299
Montana	300
Colorado	300
Advertisements	300

WE learn from Colorado that a compromise has been effected between the Stetefeldt Furnace Company and the proprietors of the AIREY Furnace (Messrs. STEWART & AIREY, of Georgetown), by virtue of which the interests of the two parties in that Territory will henceforward be identical. We are truly rejoiced at these tidings, and at the announcement that the furnace at STEWART'S works will be enlarged and improved, in accordance with the best results of practice, and without reference to those troublesome limitations to scientific metallurgy, the threatened interferences of patent rights.

Official Outrages.

WE publish elsewhere an article from the *Alta California* which illustrates the conception entertained by a certain class of people concerning honesty and fair play. The facts in the case are these. The senior editor of this paper holds the position of Commissioner of Mining Statistics under the United States Government, and is obliged to travel for several months of each year through the Western mining districts, to perfect arrangements for the collection of materials for his official reports. During this trip, he is accustomed to write occasional letters to the Journal, conveying his personal impressions of localities visited; and among these letters, in the present year, two have been published with reference to the Ely mining district in Southern Nevada. As the *Alta* knows very well, they were not written in any "official capacity" whatever; but it suits the purposes of that sheet on the present as on several previous occasions, to confound the columns of THE ENGINEERING AND MINING JOURNAL with the reports of the Commissioner. We need not explain to men of sanity and candor that there is an important distinction, lying, not in a contradiction as to facts, between the two, but in the suppression, in the Commissioner's report, of such free comments as might unnecessarily effect the affairs of private enterprise, and of such expressions of opinion, appropriate enough in a weekly journal, as would be entirely out of date by the time a public document reached the people through the slow machinery of government. The "enormous printing job" connected with these reports, amounted last year, by the way, to 5,000 copies costing about 75 cents each!

So much for the "official" character of this "outrage." The outrage itself consists in an honest and independent statement of a personal opinion. As the writer owned none of the 950,000 shares of the forty companies of Ely district, he did not feel called upon to indulge in vague puffs about the "greater or less extent" to which they had all found ore. What he did say was that two companies, on two veins (or one) had produced almost all the bullion of the district, and that outside of *these veins*, the enterprises of Pioche were either experimental or visionary or malicious. The official statistics show for the year ending July 30, 1872, that the Raymond and Ely and Meadow Valley companies produced $4,600,576 and all other mines $720,431. As the *Alta* declares that there have been for years an immense number of mines there, and all of them have found ore "in greater or less extent," it is evident that this remainder must be divided into small lots, particularly when we subtract from it the production of mines which, like the Pioche and Washington and Creole, are upon the same great veins as the two leading companies referred to.

When the *Alta* represents the editor of this paper, in his official or unofficial capacity, as denouncing the whole Ely district "as composed of wild cat and blackmail enterprises," its falsehood is sufficiently refuted by the extract which it gives, with beautiful *naiveté*, "in order not to misstate." When it says that before the discovery of rich ore in the Meadow Valley and Panacea mines "the whole district came under the denunciation of the Commissioner," it perhaps means that before such discoveries, the district was either experimental or wild-cat. If so, it has stumbled on a great truth, applicable to all mining districts before bodies of ore are found in them. Black-mailing operations come afterwards.

We are in possession of abundant evidence concerning the condition and management of many of the Ely district companies that figure on the San Francisco stock exchange. But the ups and downs of their shares, which seem to the *Alta* and its clique the most important thing in the mining industry of the country, have no interest for us or for the general public. They are notoriously independent, to a large extent, of the real value and condition of the mines; and that department of mining which is carried on in the back-offices of brokers and the editorial columns of the daily press, is one in which we do not profess to be expert. Doubtless the *Alta's* article is a success in that line; as an attempt to tell the truth, if any one should venture to judge of it from that unwarrantable standpoint, it is a distinguished failure.

In one respect the *Alta* should be praised. Desiring to contradict the views of the editor of this paper, and not possessed of any proofs to bring against them, it adopts three courses, one of which is fair. It assails his action as official and inappropriate to his office—which is *not* fair, as we have shown; it charges him with a wholesale and unqualified statement he did not make—which is foolish; and finally, it goes for him personally, in a manner which gratifies our love of logic as well as our sense of humor. This is right; let the *Alta* keep it up. Let it go boldly forward, and prove that the wretch writes poetry—though that will be hard to prove on the evidence of any of his verses!—let it convict him of dropping occasionally into literature, of hankering even after religion—and then it can point to his cowering form and say, "This is the miscreant who dares to deny 'to a greater or less extent' the dividends on 950,000 shares of stock!"

But alas for the incorrigibility of man! This obstreperous ignoramus has been meddling with mining and metallurgy all his life; he has never had any other profession; he is getting bald and gray, and refuses to change his business at his present age; he was a mining engineer and editor of this JOURNAL before he undertook work for the Government; in fact, it is asserted that his appointment as Commissioner had some mysterious connection with a reputation in that line already achieved (doubtless by the public exhibition of his ignorance through many years.) A couple of hundred of deluded beings, constituting the American Institute of Mining Engineers, and comprising the leading members of that despicable profession throughout the country, have elected him their President, and permit him to betray his "eminent incapacity" and "ignorant presumption" several times a year in their presence. Then that pestilential marplot, THE ENGINEERING AND MINING JOURNAL, under his management, persists in saying things that hurt the feelings of experienced and hard-working stock-operators. Repeated exposure of his imbecility seems to have no effect on this *enfant terrible*. The chances are, that if the *Alta* removed him, on high moral grounds, from the position of United States Commissioner, he would continue just the same, to see things, and form what he calls opinions, and express them, and find listeners—in short, to commit unofficial outrages on the feelings of the *Alta*. In branding him as a "Bohemian," the *Alta* has taken the right course; but we cannot give it much encouragement of early succes. It must be satisfied with the approval of its own conscience, and the applause of all right-minded operators for a rise in Ely stocks.

A Threatened Removal.

COLUMBIA COLLEGE has purchased land at Fort Washington, on the upper end of New York Island, and the removal of that venerable institution from its present position in the heart of the inhabited portion of the city is perhaps now only a question of time. When, fifteen or more years ago, the College was moved from its old-time resting place, one square from the City Hall, there was many an old citizen who regretted, much as he felt, the real necessity of the change. In the step now contemplated we believe the college authorities will encounter more forcible opposition. Then it was hard to see the familiar landmark pass away. But now, so far as we have heard from the graduates, there is a strong feeling against the new removal, and it is based on solid and reasonable grounds.

Columbia College does not fill that large place in the polity of New York which Harvard fills in Boston. Nevertheless, it sways an influence which few persons imagine, and which is fully known only to those who are well acquainted with the work of the institution. In addition to the college proper, where the usual means for a liberal education are afforded, there is also a Medical School of first-rate standing, a Law School with hardly a rival in the city, and a School of Mines, which, taking into consideration its reputation, its devotion to the work of mining instruction, and its success, as measured by the number of its students, may fairly claim to be without a peer in this country. Surely it is impos-

sible that four institutions of this kind, three of them intimately connected with the pursuits of men, can exist in full vigor without making a marked impress upon the city in which they are established. They do make their mark, but, in a great and changing city like New York, that mark is less easily noticed than in the more conservative and smaller Boston; just as the men of culture apparently live obscurer lives in New York than in the sister city. If Columbia, by going to Fort Washington, can build up a village of cultured families, *and keep the city at arms' length*, it too, can, in all probability, gain a more individual reputation. But that is an impossibility. The city will overtake it, and grow around it, wherever located.

Nor is this altogether a disadvantage. The college is placed just where its usefulness is greatest—in close contact with the activity which it labors to direct and inform. The gain in individuality which it might make by removal, would be purchased at the cost of convenience, and, perhaps, usefulness. Certainly, the Schools of Medicine, Law, and Mines cannot be taken so far from the city's center without serious inconvenience. The last named is constantly visited by business men who want to consult with the Professors on mining matters, the law students must be near the courts, and the embryo doctors near the hospitals. All the industrial branches of the University demand what they now have—a central position. We should tremble for the result of a removal which placed them six or seven miles away from the district which is still considered "up town."

We believe the chief, if not the sole, cause of the removal is the disagreeable nearness of VANDERBILT'S great botch in railway management called the Grand Central Depot. Though that nuisance is four blocks, or about a quarter of a mile away, the avenue opposite the college is filled all day long with half a dozen switching locomotives, and our readers all know that those are the screechiest of all engines. There is a constant change of cars, making up of trains, and blowing off of steam, as is inevitable at the chief terminus of three great and busy roads. These noises form an under-tone, through which breaks, at intervals of a very few minutes, the loud scream of the whistle. Lectures have to stop while some engineer performs on the bell-rope, or sounds defiance to a friendly rival. What the unfortunate women in the Lying-in-Hospital, directly opposite the school, do in the midst of all this infernal din, we cannot imagine; but we are very sure that at Commodore VANDERBILT'S final examination on the Judgment Day, no watering of stock, though he were guilty of all that is charged against him, and no seizure of property under the Railway Law, will be deemed half so damning as the misery caused by his (externally) hideous depot.

Nor will the underground road be any relief. It will issue into open air very near the College and will really add to the nuisance as it is now. Still it seems to us that there is a remedy for all this. A decided movement is going on to replace the present steam whistle with its hoarse scream by one which gives a melodious note, and we may without too much boldness look forward to the day when the present ear piercing shriek will be discontinued. But even under present circumstances a building on the Madison Avenue front of the present property would be in a great measure free from the annoyances which are so great a nuisance to a school fronting directly on the railroads as the School of Mines does now. It should be entirely practicable to design a building which in that situation would contain lecture rooms quite free from the noise, and would afford on the Fourth Avenue side much needed space for chapel, libraries, laboratories, and collections.

Few persons understand how important this subject is, and what a serious injury any step which lessens the usefulness of the college, may be not only to the institution, but to the cause of education in this city. Let us look for a moment at the condition of the institution.

Last year the four branches which make up Columbia College contained 855 students as follows: The College 117, School of Mines 115, School of Law 291, School of Medicine 332. This year the numbers are considerably larger, the School of Mines having 123. Of the latter number 94 students are "regular;" or students for the full course, and 29 have entered for various specialties. We doubt if a more flattering exhibit can be made by any similar school in the world. We doubt, too, if the standard of scholarship is as rigorously maintained elsewhere as here. This institution may fairly claim to be one of the most successful efforts toward a higher education that has been made in this country. Though its tenth year has only just opened, it has taken a decided position in the scientific world of New York, is active in all things scientific and in many of an industrial kind undertaken in the metropolis, and is commonly spoken of both in professional and business circles as a leading authority. It is indeed to an exceptional degree free from those slurs and innendoes which are inseparable from activity, even when that activity is strictly professional and conservative, in so speculative a pursuit as mining, and so far as our experience goes it is rarely or never referred to except with respect. Instead of removal to a distance the school needs to be brought nearer to the business center of the city—nearer to Wall street, where mining operations are daily discussed, and with which there would be incessant intercourse if intercourse could be had at the expense of only a couple of hours time instead of the full half day which is now necessary to reach the school, have an hour's talk and return.

In its foreign relations the school occupies a most honorable position. It is known throughout Europe, and in its collections are objects which declare the interest felt by foreign societies, governments and schools, in the pioneer mining school of the United States. Possessed of the best mining collections and the best mining library on this continent and filled by the most numerous classes of any mining school in the country, our New York school occupies a position which is little understood in the city, but which will one day be appreciated and spoken of with pride.

We do not know that the fiat for removal has gone out as yet, but we trust that even if it is thought best to transfer the college proper to the upper end of the island, the professional schools may be permitted to take a position nearer the business men who so often express the wish that they were more easily reached.

NEW PUBLICATIONS.

Town Geology. By. REV. CHARLES KINGSLEY, Canon of Chester. New York: D. Appleton & Co. 1872.

Mr. KINGSLEY is better known as a novelist than as a man of science. The brilliant author of *Alton Locke* and *Two Years Ago*, and, above all, of *Amyas Leigh*, is indeed not likely to win for himself in any other line of literature an equal reputation. Nor does the work before us indicate any such ambition. It is made up of a series of lectures, given to the young men of the City of Chester, in England—Chester of the Roman baths and the ancient wall and the grand cathedral. The subjects of these lectures have been so ingeniously chosen as to present convenient and complete single pictures, and yet to comprise as a whole, a panorama of all the leading facts and methods of geology. Under the familiar titles, "The Soil of the Field," "The Pebbles in the Street," "The Stones in the Wall," "The Coal in the Fire," "The Lime in the Mortar," "The Slates on the Roof," all ages, from the Post-Tertiary back to the Pre-Silurian, and all agencies, from ice to fire, are briefly but clearly presented, in colloquial style, with abundant illustration. We have noticed one inaccuracy in the book. Mr. KINGSLEY speaks (p. 162) of Darwin's theory of coral reefs, and says that as the sea bottom sinks, "carrying the coral beds down with it, the coral dies, and a fresh live crop of polypes builds on the top of the houses of their (*sic*) dead ancestors." This is not true. The polypes do not die, but climb upward, leaving the *corallum* behind them, and secreting new corallum as they ascend.

An Official Outrage.

(From the Alta California.)

There has seldom come within our observation a more uncalled-for and outrageous attack upon a branch of popular industry than was approvingly paraded in the *Bulletin* of Tuesday as "the judgment of United States Mining Commissioner Raymond" upon the value of the Ely District, Nevada, as a bullion producer. It will be borne in mind that that district has been settled by some thousands of industrious and enterprising miners, who, with little capital, have for years sought their own fortunes by developing what is known to be the vast mineral wealth of that district. These hard working men struggle against all the disadvantages which want of capital throws in their way. Their only aid is the credit derived from the natural wealth of the region. In the midst of their struggles, a Bohemian of Brooklyn, New York, by some adverse fate having been appointed to what is called a United States Mining Commission, comes forward in his official capacity and denounces the whole Ely district as composed of "wild cat and blackmail" enterprises. Of course this abominable slander finds a ready echo in the *Bulletin*, which, in reproducing it, chuckles over this stab at a leading interest of this coast. Having failed in its effort to betray this city to St. Louis, it omits no opportunity to injure its interests. In order not to misstate, we will reproduce what it gives from the Commissioner reports:

In the first place, I am compelled to say that the opinion I hear so frequently expressed concerning the chances of mining in this district lacks hitherto a solid basis of fact. I do not find satisfactory evidence that there are many reliable and profitable mines here. The large production has been obtained almost entirely from two veins (or one vein, with a spur that joins it,) and by two companies—the Meadow Valley and the Richmond and Ely. At present, it is a single, enormous and extraordinarily rich body of ore, in one of the mines of the latter company, which maintains the reputation of the district. Outside of the veins upon which these two companies are located, the numerous incorporated and unincorporated enterprises of Pioche must be set down as belonging to one of three classes—experiment, wild cat and blackmail. The experiments are of various degrees of merit and probable success. Many of them are encouraged by the circumstance that the country rock outside of the main ore veins already known abounds in seams, pockets and small bodies of ore, which yield rich mineral, and, in some cases, repay the cost of explorations. I know of one or two instances in which there is a prospect of actual stoping on a respectable scale, but there is a strong probability that the deposits of this class are either limited outlying bodies, derived from the main veins, or actually spurs which will join the latter at greater depths.

There are several towns and thousands of individuals who comprise the population of the district, and whose interests are thus flippantly held up to discredit by an officer whose existence seems to be only the exponent of an enormous printing job, for which the people have to pay, in addition to having their interests slandered. There have been for years an immense number of mines in that district. The stocks of forty of them, embracing 950,000 shares, are represented at the Stock Board in San Francisco, and the capital for working them is supplied from here. All these and other companies were started to develop the ore, and all of them have found it in greater or less extent. Two years since the Meadow Valley found it unusually rich. A little more than a year since the Raymond and Ely discovered an immensely rich body of ore. Before that date the whole district came under the denunciation of the Commissioner, who now undertakes to tell the world that this latter is the only ore body in the district, insinuating that the Meadow Valley has run out, and

that no more ore bodies can be discovered. Yet before his slander is published the ore is again coming in, and the Meadow Valley is again richer than ever. That New York poetaster undertakes to tell the world that the experienced and hard-working men who are working the hundred mines of Ely District, are forming a deceptive and dishonorable occupation in getting up "wild cat and blackmail" mining companies, and the *Bulletin* tells its readers: "As his responsibility is greater than that of ordinary experts, he is taken to be the best mining authority." Who made that eminently incapable person "an expert," is a mystery. If the *Bulletin* had said his "ignorant presumption," instead of his "responsibility," it would have been nearer the mark.

Working Men in the United States.

An interesting Report, by Consul-General Archibald, of New York, on the condition of the industrial classes in the States of New York, New Jersey, and Connecticut, all in his Consular district, has been issued among some special Consular reports of this year.

He states that during the last two years there has been an increased demand for skilled labor in some trades, but the supply of unskilled labor has exceeded the demand in the large cities. The condition of the farm laborer is, on the whole, a satisfactory one. His wages are stated as ranging from 38s. per month (and board), in December and January, to £4 10s. (and board) in July. He is generally placed on terms of equality with his employer's family; but men are usually only hired for the season—that is from April to November, and then, during the other months, work has to be sought for in the manufacturing towns, or in general labor. The demand for good domestic servants is always greater than the supply. As a rule, native Americans never engage themselves as domestic servants in the cities. In-door men servants in the city of New York get from £6 to £9 per month, with board; female cooks from £3 10s. to £5, and housemaids 54s. to 60s. Such wages commonly lead to extravagance in dress and a spirit of restlessness and independence; the time is almost longed for when Chinese immigrants may be employed in domestic service. The wages of common laborers in the city of New York vary from 6s. to 8s. per day, without board and lodging; but labor of this class is less continuous than that of others. The wages of skilled laborers are much higher: carpenters, 12s. to 16s. per day, without board; shoemakers, 32s. to 60s. per week, also without board; and tailors, 48s. to 80s.; printers, 60s. to 80s.; weavers, 40s. to 56s.; bakers, 24s. to 48s. per month, with board; and grocery clerks, 32s. to 60s., also with board. The practice of employing operatives on piece work is increasing. The Consul sends lists of wages in factories, at iron works, and in various callings; in some iron works the rate of wages varies with the price of iron. Passing to the important subject of the purchasing power of money, he states that rent, fuel, woollen clothing, hats, and shoes are, in the State of New York, double the price paid for such articles in Great Britain at the beginning of this year. Taking one with another, he estimates that £1 sterling will, for the mechanic or laborer in England, defray the cost of rent and necessaries which, in the State of New York, would cost him 35s. His estimate and his inquiries were made in March last. He cites the instance of a gun-barrel browner from Birmingham, with a wife and three children. His weekly wages increased from 45s. in Birmingham to 68s. 9d. in New York, but his expenditure for food, fuel, and four-roomed tenement increased from 30s. 6d. to 46s. 6d., leaving a balance of 14s. 6d. in Birmingham, and 22s. 3d. in New York; but the purchasing power of the balance, expended in clothes, ale, crockery, blankets, &c., proved less in New York than in Birmingham. The Consul says that throughout the Eastern States ordinary laborers work longer time generally in America than in England, but they work with more will and energy. More work is "got out" of laborers, skilled or unskilled. The American "boss," or foreman, is more exacting than the British master; and there is generally less of mutual friendly feeling between master and man than in England. "A laborer working over-time, and with steady employment, is relatively better off in England than in the State of New York. If obliged to lodge in one of the large "tenement houses" in which half the population of the city of New York are said to live, a mechanic has to pay from 24s. to 40s. a month for a single room in a most unhealthy house. Speaking of localities outside the city of New York, the Consul says that there is vastly less drunkenness and waste of time than in Great Britain; men do not frequent tap-rooms and clubs, and are in bed at earlier hours than in England. Female influence is greater than in England, and men are comparatively more thrifty. The climate is salubrious, the waste of vigor in the great heat of summer being restored in the bracing autumn; but there is a greater tendency to nervous excitement than in Great Britain, and greater wear and tear of the constitution, and probably less longevity. Tea or coffee for breakfast, and tea with supper, are the common beverages; the price of wholesome beer is excessively high, and the only stimulant accessible at a moderate cost is a vile compound passing under the name of whiskey. The Consul observes that while prosperity, though with hard labor, almost certainly awaits the agricultural immigrant, who has the means, energy, and strength to proceed at once to the Far West, the case is different with him who, trained in some special calling, remains seeking employment in one of the large Atlantic cities. A skilled workman, if fairly well off at home, should carefully ascertain his chances and prospects in the United States before quitting his country. The Consul says: "I have known numerous instances of disappointment of men engaged in England to work in foundries, machine shops, and factories in this country, some of whom have been glad to return home, while others have not had the means of returning." Unskilled laborers, who at once engage in cultivating the prairie, or subduing the forests, prove of more value to the country than skilled labor; and while for the former there is every day a broader opening as new routes are made through the wilderness, for those who remain in cities, dependent upon engagement in special avocations, the chances become gradually more restricted. Mr. Dennis Donohoe, our Consul at Baltimore, also preaches caution to the mechanic in steady employment at home, and advises the farm laborer who emigrates "to push on for the Western States." Mr. Donohoe says he is well acquainted with the hero of the following tale: "The son of a tenant of four acres on the estate of a nobleman in Ireland emigrated to the United States about 1848. At first he was a laborer in an iron foundry; in 1852 he was a working gardener, on wages £6 per month. In 1870 he transmitted to Ireland enough money to purchase his landlord's castle, then for sale, and at the same time owned in the United States a sugar plantation, upon which he had spent £40,000, a very fine farm and valuable stock, and a handsome town residence. He came very near being elected United States' Senator. I doubt very much if, had he remained in Ireland, he would even have had the chance of being a Poor Law Guardian." It is not stated in what way he made all this money.

Our National Industry.

The census office has just completed the tabulation of the statistics of manufactures of the United States, for the year ending June 1, 1870. The total number of manufacturing establishments of all kinds is 252,148; number of steam engines, 40,191, with a horse-power of 1,215,711; number of water-wheels, 51,017, with a horse-power of 1,130,416. The average number of hands employed during the year was 2,053,988, of whom 1,615,594 were males above sixteen years of age, 323,768 females above fifteen, and 114,626 children and youths. The amount of capital invested was $2,118,247,069; of wages paid, $775,621,593. The value of material consumed was $2,488,291,952; of products $4,232,625,892. Of this production $13,040,644 is returned from Alabama, $185,410 from Arizona, $4,629,234 from Arkansas, $66,594,556 from California, $2,852,820 from Colorado, $161,665,474 from Connecticut, $178,570 from Dakota, $16,791,382 from Delaware, $9,292,173 from the District of Columbia, $4,685,403 from Florida, $31,196,115 from Georgia, $1,047,624 from Idaho, $205,620,672 from Illinois, $108,617,278 from Indiana, $46,534,322 from Iowa, $11,775,823 from Kansas, $54,625,809 from Kentucky, $24,161,905 from Louisiana, $79,497,521 from Maine, $76,593,613 from Maryland, $553,912,568 from Massachusetts, $118,394,676 from Michigan, $23,110,700 from Minnesota, $8,154,758 from Mississippi, $206,213,429 from Missouri, $2,494,511 from Montana, $5,738,512 from Nebraska, $15,870,539 from Nevada, $71,038,249 from New Hampshire, $169,237,732 from New Jersey, $1,489,868 from New Mexico, $785,194,651 from New York, $1,921,327 from North Carolina, $269,713,610 from Ohio, $6,877,387 from Oregon, $712,178,944 from Pennsylvania, $111,418,354 from Rhode Island, $985,898 from South Carolina, $34,362,626 from Tennessee, $11,517,302 from Texas, $2,343,019 from Utah, $32,184,606 from Vermont, $38,364,322 from Virginia, $2,851,052 from Washington Territory, $24,118,051 from West Virginia, $77,214,326 from Wisconsin, $765,424 from Wyoming.

MINING SUMMARY.

California.

AMADOR COUNTY.

The *Dispatch* of the 5th says: We were shown some splendid quartz yesterday, which has been taken from the Otis mine at a depth of only about thirty feet. Those who claim to be good judges of quartz pronounce it even better than any ever taken out of the famous Kennedy mine at the same depth. The Otis mine is situated about half a mile south of Jackson, near John Campbell's mine.

DEL NORTE COUNTY.

A correspondent of the Crescent City *Courier*, writing from Happy Camp, September 26th, says: Our mining companies are going ahead rapidly. J. R. Brett is advancing his work with vigor. His sawmill is now running, and his hands are already at work laying his flume. He expects to have his ditch completed a distance of eighteen miles this fall. James Camp & Co. are also digging a ditch from the west branch of Indian creek, a distance of five or six miles, on a hill know as Quartz Hill, which is supposed to be very rich. Mr. Ambrose is also prosecuting his work on Bunker Hill with skill and enterprise, and it is reported his prospects are very flattering; indeed, it is the opinion of old and skillful miners that there is a bright future before us here in Happy Camp, as our mines are only beginning to be developed. S. S. Richardson is considered taking out a large amount of money.

KERN COUNTY.

The following is from the Havilah *Miner* of the 28th ultimo: The mining prospects of our county have not been for many years so encouraging as now. The results of practical working on a small scale, have demonstrated that the mines of Kern County are as rich, with a few exceptions, as any on the coast.

The late discoveries of new mines show that our mineral region contains large quantities of gold, yet; and corroborates the fact that our district is of considerable extent—more so than heretofore supposed. Parties have gone from here to San Francisco for the purpose of negotiating with capitalists who have already signified their intention of starting the Joe Walker mine. It is said that the water can be taken out for about $20,000, and that active operations can be resumed by an expenditure of $30,000 all told.

The mines of Kernville are looking up. The Bright Star and St. John mines are doing better than ever, and the McKeadney and Jupiter mines hold their own. We possess the mines, now let us interest capital and open them.

NEVADA COUNTY.

The *Transcript* of October 5th, says: "Recently some life was manifested in copper mining in the lower part of this county. The old Well lead, which was worked exten-

sively some years ago, has been relocated and a Stockton company has been organized to work in the copper district. There are very many mines in the lower part of Rough and Ready township from which good ore was obtained, but the cost of extracting it and the impossibility of working it upon the ground, caused the enterprises of this character to fail at that time."

PLACER COUNTY.

The St. Patrick company, bondees of the Crater Hill mine, near the St. Patrick mill and mine, have crushed some thirty tons of quartz from the Crater Hill shaft, which yielded some $90 per ton.

SIERRA COUNTY.

The New and American mines at Sawpit Flat are turning out to be good property.

A saw mill is being put up near Milton for the purpose of filling a contract for 2,000,000 feet of lumber for the North Bloomfield Mining Company, to be used in the construction of a flume some seven or eight miles long. This flume is a part of a ditch some thirty or forty miles long.

The Sierra Butte Company are busy putting in a foundation for their new mill. They have 227 men on their pay rolls. They have not commenced work on their new flume, and probably will not be ready to commence that job for some time yet.

TUOLUMNE COUNTY.

The Sonora *Independent* of the 5th, says: "We were shown some specimens of quartz rock from Mrs. Wellington's ranch, about a mile and a half southeast of Sonora, discovered by some Mexicans. The specimens are from a depth of but three feet, and thickly studded with gold. It is said that there are many quartz leads in that section, and that the dirt adjacent the Mexican lead pays handsomely.—San Francisco *Bulletin*.

KERN COUNTY MINES.

The mining prospects of our county have not been for many years so encouraging as now. Its existance is no longer an experiment. The results of practical working, on a small scale, have demonstrated that the mines of Kern County are as rich, with a few exceptions, as any on the coast. The close proximity of the railroad, in a short time, will bring our mines to the gates of the sea, and put us in communication with all lands. Our resources, both agricultural and mineral, will become known, and as a consequence an influx of population and capital will follow; our mines will be opened, and the thousands of acres of untilled lands in the Great Valley, Tehatchipah, South Fork and Linns Valley, will, to a certain extent, be put under a high state of cultivation. Our mountains of gold will be made by the introcuction of capital to yield up their wealth of untold millions, which now lies locked up in their ledges for want of developing power, enterprise and capital.

The late discoveries of new mines show that our mineral region contains large quantities of gold yet; and corroborate the fact that our district is of considerable extent—more so than heretofore supposed.

Improved processes for the reduction of ores are being introduced throughout the mining regions of the world; and Swansea's secret power of reducing ores is becoming equalled. It is cheaper for Swansea to come to our mineral mountains than to move them to Swansea; and sooner or later she will have to succumb to Pacific Coast mines. The question of an opposition company to that of Swansea being formed in San Francisco has been talked of; if started, with equally as good reduction powers as Swansea possesses, we will see a new era in mining operations on this coast.

Parties have gone from here to San Francisco for the purpose of negotiating with capitalists who have already gnified their intention of starting the Joe Walker mine. It is said that the water can be taken out for about $20,000 and that active operations can be resumed by an expenditure of $30,000 all told. The mines of Kernville are looking up. The Bright Star and St. John mines are doing better than ever, and the McKeadney and Jupiter mines hold their own. We possess the mines, now let us interest capital and open them.—*Havilah Miner*.

From the Grass Valley *Union* of Oct 20.

EUREKA MINE—ANNUAL REPORT.—The annual meeting of the Eureka mine was held in San Francisco on the 17th inst. It will be seen from the following synopsis from the annual published report, that the operations of the mine for the past year have been much more favorable than was generally supposed: The annual report shows bullion receipts for the year to September 30th, 1872, $219,410; total receipts, $223,922 65; expenses, $162,122-79; profits, $61,799 86, of which $20,000 was paid for dividends; cash on hand October 1, 1872. 60,554 54. The Superintendent, Wm. Watt, states: "There were 9,925 tons hoisted and 9,740 tons crushed. There are upward of 4,000 tons of good pay ore in sight, which will pay all ordinary expenses, and for the the further developement of the mine for the next six months at least. We have struck nothing encouraging in Eureka proper, but in the Mobile cross-cut we struck a stratum of ground which has drained the Roannaise shaft; showing a connection between the two. In the bottom of this shaft (which is sixty-eight feet deep) there is a ledge two and a half, feet wide, with perfect walls; but the quartz is poor, and we are preparing to sink on the ledge near this point and prove it to a greater depth, and as it is the most cheering prospect of all, I hope it will turn out equal to our expectations." This mine, from October 1st, 1865, to October 1st, 1872, extracted $3,585,513 of bullion, and the net profits were $2,235,651, of which $1,714,000 were paid to the stockholders. The following were elected as Trustees for the ensuing year; George W. Beaver (President,) R. F. Morrow, William Watt, L. S. Adams, S. B. Sherwood; Superintendent, William Watt; Treasurer, Francis Berton; Secretary, E. Wegener.

Montana.

THE CHERRY CREEK MINES.

From the *New North West* of Sept. 28.

The new mines in Madison County, some twenty-five miles from Bozeman, bearing the above name, are attracting considerable attention on the East Side and from the present indications seem to warrant it. There is a considerable portion of the rock remarkably rich, and all of high grade. We were told that fully one hundred supposed leads have been staked, although only a few of them have been opened. The greatest development yet made is on the Enselman, which has several shafts started on it, the deepest of which is twenty-five feet. One shaft being sunk by Geo. Hurst shows a 12 inch crevice at that depth. The adjoining claim owned by Enselman shows a three-foot crevice at 20 feet. He asks $20,000 for the claim. The leads so far show very thin seems of quartz, but will pay big if they hold up to the present width. Messrs. Geo. Hurst, P. A. Largey, R. Merk, Capt. Southmayde, N. J. Davis, Chris. Houser, H. K. Harvey, and other Virginians own large interests and are developing their property. About seventy-five men are now at work in the camp, and the richest ores are being sacked for shipment. A town is being started and several houses are in process of construction on a beautiful town site. The country lies low and advantageously for access, wood, water and general facilities. It is about 115 miles from Deer Lodge via Butte, Pipestone Pass, Fish Creek, Willow Creek, and the Madison Bridge, from which it is about four miles distant. With work prosecuted as it is being now, a few months will demonstrate the value of the district, and we incline to the belief that it will be a material part of the wealth of Montana.

Colorado.

From the Colorado *Miner* of October 10:

DEMOCRAT MOUNTAIN.

There are many noble veins situated on this mountain, but unless the present depressing influences of an over production of ore above the capacity of our mills to treat the same, and the disposition on the part of ore buyers to purchase nothing but high grade ores for foreign shipment are removed, many owners of mines situated on this mountain will be compelled to move along with the rapidity of that remarkable racer, the *snail*. It is high time that measures should be taken to increase the capacity of our silver mills, or build more of them. It is evident to all that the money market is tight and begins to pinch many, especially that class of men who work mines on tribute. One miner said in our presence this morning, "I have 500 tons of 200 oz. ore on my dump for which I can find no market at home. I will be compelled to discharge some of my men and go slow for a while." In this one instance who have $130,000 coin value locked up in ore on one dump. No wonder we have tight times.

But this little cloud on our mining industry will soon pass away. Steps will soon be taken to build more reduction works, or greatly increase the capacity of our present mills. Where the ore is there will be mills for treating the same.

CLIFT MINE.

The breadth of this great true fissure vein is full 30 feet between walls. The gangue is gray quartz and feldspathic rock. The mineral, principally argentiferous galena and quite free from blende, lies in pockets interspersed in the gangue. Native silver, gray copper, and silver glance occur quite frequently in the ore.

The mine is favorably situated for driving adits on the vein, and gaining great depth from the surface. Two adits have already been driven on the vein, one 440 feet in length, gaining a depth of 240 feet from the surface, ane another 340 feet in length, gaining a depth of 200 feet from the surface. The levels are connected by an air shaft. It is true that some barren ground has been passed through in the workings of this mine, (and what mine does not contain some barren grounds?) but the fact has been clearly demonstrated that the Clift is a very valuable mine, and has a capacity of producing large quantities of rich milling ore.

From George M. Morse, one of the owners, and managing superintendent of the mine, we learn the following interesting particulars:

One mill run at Stewart's yielded as high as $1,260 coin per ton. Assays ranging from $1,300 to $10,000 coin value have frequently been obtained from ore taken from the Clift. The yield of the first-class ore, not closely dressed, generally foots up to 500 ozs. per ton, and the second class to 250 ozs. The ore taken out of the mine has more than paid for driving the adits, sinking the air shaft, building a trail to the mine, erecting a boarding house and doing a large amount of dead work about the mine. The total cash product of the mine has been about $73,000.

It is our opinion that the owners of this valuable mining property have only arrived at the margin of success. Depth will develop immense deposits of rich mineral in the Clift.

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The special advantages of the ENGINEERING AND MINING JOURNAL, *as a medium for advertisers, are so great and so widely known that it may seem almost needless to call attention to them. It is extensively circulated among the engineers of the country and takes a position in this respect before any other publication of the kind. It has a large and constantly increasing circulation among miners and mine owners, and men connected with mining operations generally. As it is the only paper in the country that makes this subject a specialty it has this field entirely to itself, and is the only direct and reliable means of reaching this class of persons. Being kept on file by almost every subscriber, it is doubly valuable as a permanent means of keeping an advertisement before the public. It is the Organ of the* AMERICAN INSTITUTE OF MINING ENGINEERS, *and is regularly received and read* BY ALL THE MEMBERS AND ASSOCIATES *of that large and powerful society,* THE ONLY ONE OF THE KIND IN THIS COUNTRY. *It is therefore the best medium for advertising all kinds of machinery, tools and materials used by engineers or their employees. It is the recognized organ of the coal trade, and is taken extensively by the trade throughout the country, and presents the very best means of reaching that very important class of men.*

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SAFETY FUSE,

ELECTRICAL BLASTING APPARATUS, &c.,

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It has been the agent for the successful introduction to notice and sale of American productions in the countries named; and, by a steadily increasing circulation in that direction, has proven the most valuable medium for our trade interests abroad as well as at home.

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Oct.1.1.year

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Office, corner Fifth Avenue and Smithfield Street, Pittsburgh.

Our central location enables us to draw from both sides of the Allegheny Mountains Metals and Ores best adapted for making a No. 1 Rail, and, together with our Improved Machinery, are a sufficient guarantee of our ability to produce Rails of a quality unsurpassed for durability and strength, by any foreign or domestic manufacture.

New Patterns, of any desirable weight, made to order on Short Notice.

We respectfully solicit orders for New Rails, or Re-rolling. June 25.1y

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OF THE

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Whose representative for the United States,

R. ROBERTSON, 149 BROADWAY, NEW YORK,

Is ready to receive consignments of

ORE and all kinds of FURNACE STUFF

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Full particulars given on application.

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May 17:1y

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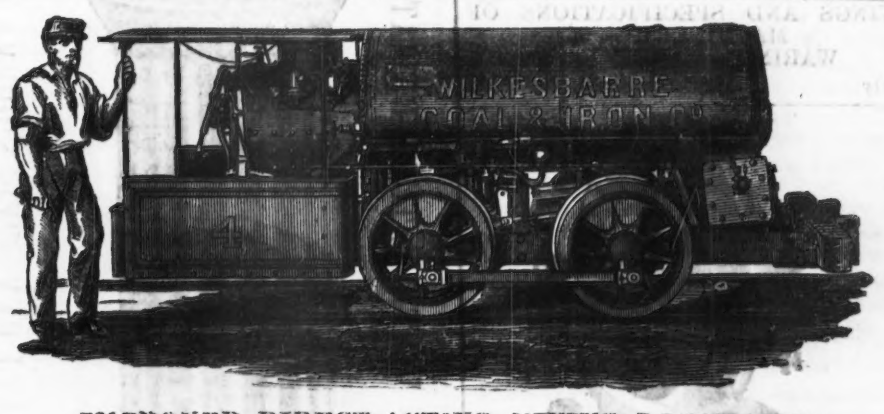
GORDON MONGES, Treasurer. B. C. WEBSTER, President

WORKS, BETHLEHEM, PA OFFICE, 333 Walnut Street, Philadelphia.

JOHN JEWETT & SONS, AGENTS, 182 FRONT STREET, NEW YORK.

OXIDE OF ZINC, SPELTER, SHEET ZINC.

Jun28:1y SPIEGELEISEN CINDER FOR BLAST FURNACES.



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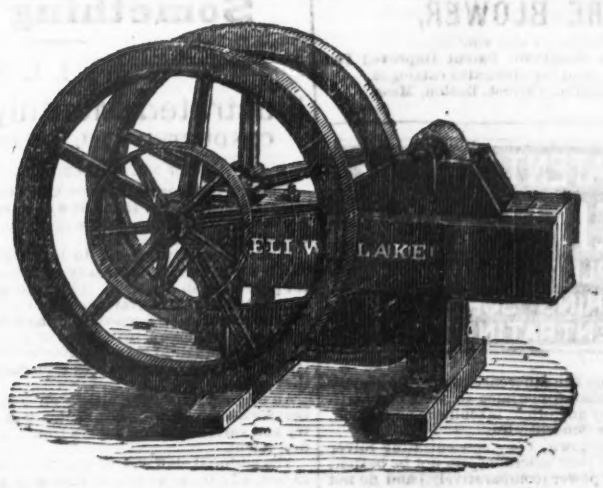

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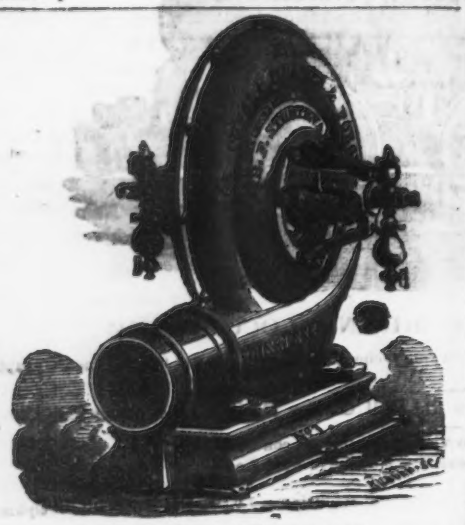

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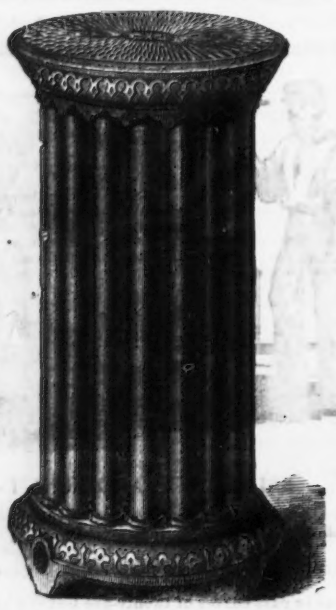

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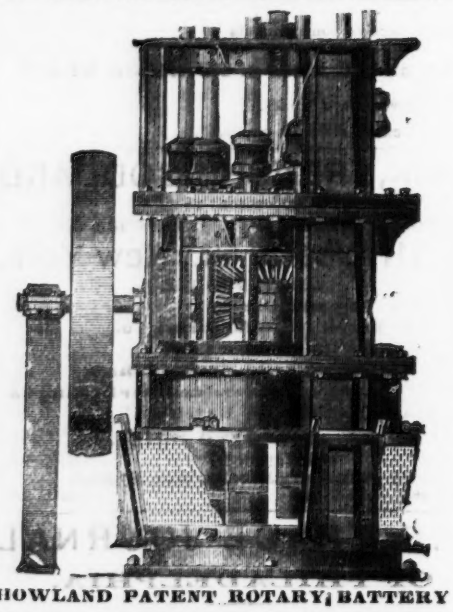

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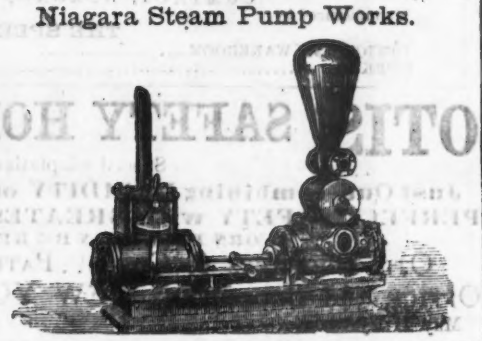

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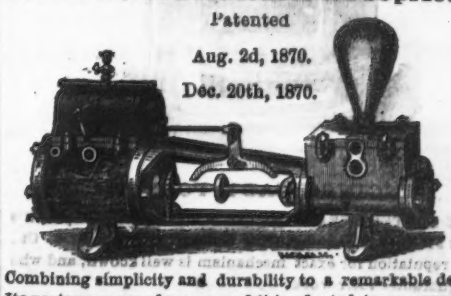

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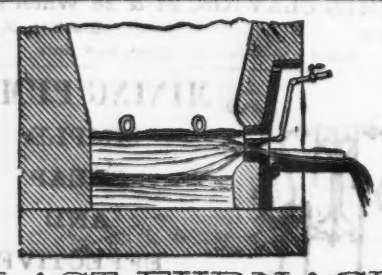

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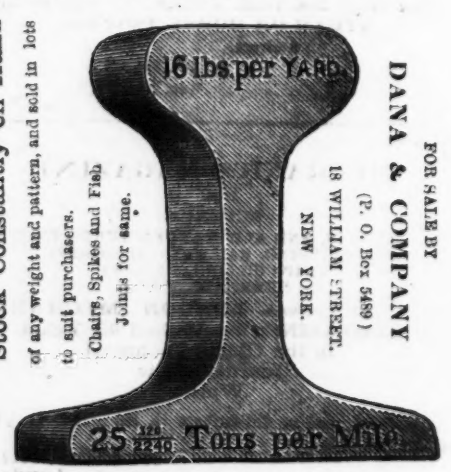

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